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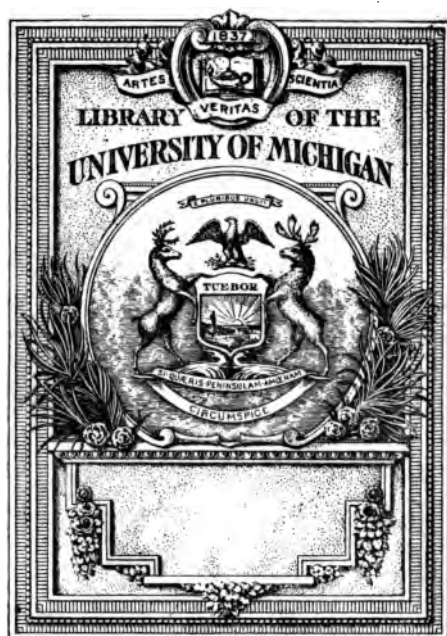
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TO
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NOTES ON CHILD STUDY

BY

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NOTES ON CHILD STUDY

NOTES ON CHILD-STUDY

I. INTRODUCTION

A CHILD, like an adult human being, is both a body and a mind, and the study of children includes the study of both their bodies and their minds. A complete science of childhood would give a complete account of the nature of children's bodies, of the way they worked and of the effects brought about in them by all sorts of causes; and a similar full account of their thoughts and feelings, of their mental make-up, of the ways their minds were influenced by all sorts of things. It is clear that a book the size of this cannot pretend to give such a complete account of the physical and mental life of children.

That would involve a presentation in detail of the facts of human anatomy and of the facts concerning the growth of children, of human physiology, of children's diseases, including the various common physical abnormalities, of general psychology, of the psychology of childhood, and of the nature and causation of mental and moral defects. It would require a careful discussion of the influence of heredity. No one save a student of a number of sciences could write such a book; it would take years for any beginner to master it.

The aim of these notes will be the modest one of putting before teachers and others who have to do with children some facts concerning the bodily and mental lives of children which are theoretically interesting to the intelligent

student of human nature or practically important in our dealings with children, and at the same time are not incomprehensible by the average college or normal school student.

It is obvious that our ordinary common-sense acquaintance with people does not provide us with correct notions about children. For children are not like grown-up folks. They are not miniature adults, but are in reality different beings. Their bodily make-up is different, as truly though not as much different as is the tadpole's from the frog's. Says Dr. Oppenheim:

"We have been in the habit of looking upon a child as a man in small, of looking upon a man as a child somewhat strengthened, with greater experience and knowledge. Outside of these factors of experience, knowledge and strength, the child and man seem practically the same. So true is this observation that society founds its judgments accordingly; it prescribes its methods of education, of social and domestic care accordingly, it sees almost no differences outside of these adventitious ones between them.

"As a matter of fact, it would be hard to find many salient factors, beyond the most fundamental laws, in which the infant and adult exactly resemble each other. Multiply the proportions of the infant to those of the adult, and you will have a being whose large head and dwarfed lower face, whose apex-like thorax, whose short arms and legs, give a grotesque appearance. The two do not breathe alike, their pulse-rates are not alike, the composition of their bodies is not alike.

* * * * *

"Again, the common necessity of eating has different objects in the two ages: in the adult the repair of body waste is the only end sought; in the child, besides this, there are additional reasons, such as the supplying of greater energy than at any previous time, and also the forming of entirely new tissue, such as would be commensurate with added growth.

* * * * *

"On more minute examination, one finds greater and greater differences, until one comes to believe that we have been trying to see our children in a totally false light."¹

Just as a child's body is not the same as an adult's, only smaller and weaker, so his mind is not the same as an adult's, only containing less knowledge and having less capacity for

¹ *The Development of the Child*, pp. 12, 13 and 14.

work. The most ordinary observation proves that in his likes and dislikes, his emotions and impulses, his control over his ideas and movements, as well as in his more general mental faculties, the child differs from his future self. He astonishes us by his queer remarks. His mental attitude is often so foreign that we cannot comprehend it. The ways we take to get along with adults will not succeed with him. The knowledge we have of people in general does not fit him.

If we wish to get along with children, then, we must get to know them. Now there are two sorts of knowledge of children, as of adult human nature. One may by dint of practical dealings with them become able to do the right thing at the right time, often without knowing why he does it. Just as the gifted clergyman or politician learns to get on with people, so the gifted teacher may learn from experience to get on well with children. On the other hand, one may gain from books or observation or experiment definite general principles about their physical and mental characteristics. Knowledge of the former sort can, for practical purposes of direct dealing with individual children, seldom be replaced by knowledge of the latter sort.

Yet this more abstract and general knowledge has several advantages on its side. It can be gotten more easily and by any one, in proportion to his general insight, whereas the former sort can be gotten only by those who have at the start a natural gift for managing children, and only in the school of actual experience. Moreover, it may stimulate, and always is helpful in criticising any one's "intuitions" about children. It may, even when useless as regards any individual, lead to important practical steps in the treatment of large groups, *e. g.*, in organizing a school system or a course of study, or in constructing educational theories or in devising methods of teaching. It may also beget an interest in

children and habits of observing them which will prepare the soil for the growth of that tact which is the luckiest possession of the teacher.

Under the limitations of its space and of the equipment of its readers, this book aims to give this latter sort of insight into children and of knowledge about the ways they think and act.

2. THE LIMITATIONS OF CHILD-STUDY

If children are not like adults either in body or mind, no more are they like each other. Just as the six-year old scholar differs from the thirty-year old teacher, so the two-year-old infant differs from the six-year-old, and so also does the latter differ from the sixteen-year-old adolescent. Day by day children become different beings. What is true of two-year-olds often will not be of six-year-olds, and what is true of six-year-olds often will not be of ten-year-olds. It is unwise, therefore, to use the words "the child" or "children" without some definite statement of the age referred to. We are studying beings who are really continuously changing. However, they change more rapidly at some periods than at others, and we may conveniently divide this continuous growth into the following periods:

- A. Birth to $1 \pm \frac{1}{4}$ ¹
- B. $1 \pm \frac{1}{4}$ " 5 ± 1
- C. 5 ± 1 " 12 ± 1
- D. 12 ± 1 " 14 ± 1
- E. 14 ± 1 " $18 \pm ?$
- F. $18 \pm ?$ " $25 \pm ?$

We may, again for convenience, call these periods:

- A. Infancy.
- B. Babyhood.
- C. Childhood.
- D. Transition.
- E. Adolescence (early).
- F. Adolescence (later).

¹ By $1 \pm \frac{1}{4}$ we mean that we do not pretend to set an exact limit of one year, but that it may be two or three months shorter or two or three months longer. Similarly, by 5 ± 1 we mean somewhere between 4 and 6. The limits for D, E and F will be about a year earlier with girls than with boys.

There is a real basis for some such division. *A* probably represents a stage of mental life comparable to that of the lower animals. In *B* all the general human mental functions appear. In *C* the child can supply his own physical wants to such an extent that he can be left without the care needed in *A* and *B*. In *D* there are probably rapid changes in his mental as well as physical make-up. In *E* and *F* we have the broader life due to new functions. But we do not know enough about these characteristics of different ages to make the lines of separation exact, or to accurately characterize each period. So for the present we may use these periods simply to give definiteness to our statements. For instance, unless some exact statement is made, we shall in this book use "children" to designate children of group *C*. In section 19 we shall treat of the period *B*, and in section 18 of the periods *E* and *F*.

Besides differences between children due to age, there are evidently individual differences. Of 100 children all precisely ten years old there would rarely be any two that would think just alike. Because of the great differences among children, it is often said that the only profitable study of children is the study of individuals—the observation of particular ones. General statements about children *must be false*, it is said, for no two children are alike mentally. We are advised, therefore, to take some single youngster and study him, his likes and dislikes, his powers and failures, his interests and habits, etc., etc. Such work is of course valuable, but the claim that general statements are not also valuable is absurd. It rests upon the nonsensical idea that because a certain statement about a group of facts is not true of every individual in the group, it is worthless. When we say that men are able to reason we state a fact of value, even though there are thousands of idiots; when we say that lawyers make more money than hod-carriers, we state a fact of

value, though we cannot thereby tell whether or not any particular lawyer gets more pay than any particular hod-carrier. Statements of probabilities are of value as well as statements of so-called certainties. Now statements about children that reach beyond commonplaces are almost sure to be statements of probabilities. If we say that children are more easily influenced by suggestion than adults, we do not thereby know that any particular child will be so, but we know that he *probably* will. And if in our statement we give some measure of the degree of suggestibility of the children (for instance, that sixty out of a hundred of them would be influenced by a suggestion which would influence only twenty out of a hundred adults), we can know just what the probability is. It would be highly worth while to know that there were, as in this imagined case, three chances to two that a particular child would be so and so or do so and so. In almost all our dealings with people we go on probabilities, and when we have an exact knowledge of just how great the probability is, we have first rate knowledge. Certainty is really only a very great probability. Another example will emphasize this. Dr. Francis Warner says: "Children with developmental defects often . . . are dull." This of itself is valuable, as it implies that this probability is greater that dullness will be a quality of any single child with developmental defects than of the average child. Later he says that the percentage of dull children among those with developmental defect is 41.6; that is, that there are 41.6 chances to 58.4 (or roughly, 4 to 6) that any single child with developmental defects will be dull, whereas of children in general only 7.4 per cent. are dull, that is, that there are in the case of any child taken at random 7.4 chances to 92.6 (roughly, 1 to 13) that he will be dull. We know then that dullness is over 8 times as likely to occur in a child of the first sort as in children in general. It would be the grossest sort of error

to suppose that because developmental defects do not in every case involve dullness, we should not know about them.

In yet another way we may make our general statements about children more profitable. Suppose that we were told that 150 sixth-grade children, when given five minutes to mark the misspelled words in the passage given on the opposite page, marked on the average 41 words. That would be a rather useless bit of knowledge, for it might be that 75 children marked 81, and 75 marked 1. It might be that 10 marked 100, and 140 marked 36 or 37. These totally different facts would yet give the same average. It might be that each and every one marked 40 or 42 words. Just so a statement that the average wealth of ten men was \$1,000 might mean that one had \$10,000 and the rest nothing, that one had \$9,991 and the rest a dollar apiece. An average means little unless we know the *extent of variation from it*. Let us see the advantage of adding that knowledge in the case just mentioned. The real facts about the ability of those sixth-grade children to mark misspelled words are seen from the frequency curve (Fig. 1), which expresses graphically the table given below it.¹ The heights represent the number of children who marked between 1 and 5 words, 6 and 10, 11 and 15, 16 and 20, etc. We know now just what our average means, and the deviations of the 150 from it, and how likely it is that in a similar 150 children we will find a child who will mark over 70, under 20, between 40 and 45, etc., etc. We know, for instance, that over half of the children marked between 26 and 55 words, that no one marked more than 90, that there are about 24 chances in a hundred, or 1

¹ Instead of giving the whole frequency curve, we may under certain conditions give a measure of the amount of difference from the average, which is not exceeded by 68 per cent. of the cases. This is called the mean variation. From it, in the case of many averages, we can calculate all the other probable deviations; can tell, that is, how many cases will deviate so much or so much from the average.

MARK EVERY WORD THAT IS NOT SPELLED CORRECTLY.

1. On the 3d of September, 1832, intelligence was brought to the collector of Tinnevely that som wildd eliphants had appeared in the neighborhod. A hunting party was imediately formed, and a large number of nattie hunters were engaged. We left the tents, on horsback, at half-past sevin o'clock in the morrning and rode thre miles to an open spote, flanked on one sid bye Rice-fields, and on the other by a jungle.

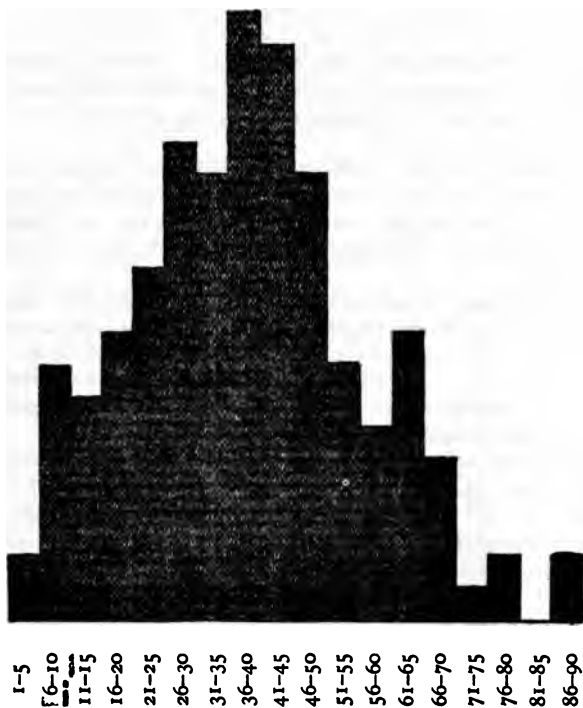
2. After waiting som time, Captain B—— and myself walked across the rice-fields to the shad of a tree. There we herd the trumpett of an elephant; we reshed across the rice-fields up to our knes in mud, but all in vain, thogh we came upon the trak of one of the animels, and then ran five or six hundredd yards intoo the jungle.

3. After varius false allarms, and vane endeavors to discuvor the obgects of our chace, the colector went into the jungle, and Captin B—— and myself into bed of the stream ' where we had sen the traks; and here it was evedent the elaphents had passed to and fro. Disapointed and impasient, we allmost determened to giv up the chace and go home; but shots fird just before us reanimated us, and we proceded, and found the collector had just firded twicce.

4. Of we went throuh forest, over ravin, and through strems, till att last, at the top of the ravine, the eliphants were seen. This was a momant of excitment! We wer all scatered. The collector had taken the midle path; Captain B——, some huntsmen, and myself took to the left; and the other hunters scrabled down that to the rite. At this momunt I did not see enything but after advancing a few yards, the hugh hed ef an elephunt shaking abuve the jungle, withen ten yards of us, burst sudenly upon my view.

5. Captain B—— ande a hunter justt befor me; we al fired at the same moment, and in so dirrect a line that the percussion cap of my gun hitt the hunter, whome I thought at first I had shoot. This acident, thogh it prouved slight, troubled me a litle. The grate excitment ocasioned by seeing, for the first tim a wild beat at liberty and in a state of natur, product a sensation of hop and fear that was intens.

FIG. 1.



The heights at the different points show the number of children marking the number of words shown beneath:

| 2 children marked between 1 and 5. | | | | |
|------------------------------------|---|---|---|----------|
| 8 | " | " | " | 6 " 10. |
| 7 | " | " | " | 11 " 15. |
| 9 | " | " | " | 16 " 20. |
| 11 | " | " | " | 21 " 25. |
| 15 | " | " | " | 26 " 30. |
| 14 | " | " | " | 31 " 35. |
| 19 | " | " | " | 36 " 40. |
| 18 | " | " | " | 41 " 45. |
| 14 | " | " | " | 46 " 50. |
| 8 | " | " | " | 51 " 55. |
| 6 | " | " | " | 56 " 60. |
| 9 | " | " | " | 61 " 65. |
| 5 | " | " | " | 66 " 70. |
| 1 | " | " | " | 71 " 75. |
| 2 | " | " | " | 76 " 80. |
| 0 | " | " | " | 81 " 85. |
| 2 | " | " | " | 86 " 90. |

to 4, that any of these scholars you took would mark between 36 and 45 words, about 75 in a hundred or 3 to 1, that any one you took would mark between 21 and 60 words.

The proper kind of general statement, then, not only tells us that on the average such and such a thing occurs, but recapitulates all the important facts about its occurrence.

If one other requisite is fulfilled our general statements will acquire still more worth. This requisite is that we be told how far the individuals on whose behavior the statement is based are representative of the class about which the statement is made. If, for instance, we should claim that sixth grade children in general would on the average mark 41 words in the test described, we could do so rightly only after showing that the 150 children tested were, as regards this test, true representatives of the class "sixth grade children in general," that no different average or range of variation from it would be obtained if we tested all the sixth grade children. Even when the individuals on whose behavior the statement is based are not exactly representative of the total class, we can use the information they give, provided we know *how* nearly they represent it, within what limits the true average, in this case the average for all sixth grade children, will probably lie. This can often be determined. Just how, this is not the place to explain.

The gist of this discussion is as follows:

The phenomena of the physical and mental lives of children are variable phenomena. The behavior of the same child, of different children of the same age, of children of different ages—all are phenomena that are not fixed or absolute, but are variable. This does not prevent child-study from gaining valuable, even exact, general statements. We can make our statements more valuable and more exact (1) by giving the numerical probability in any statements of *is*

or *is not generally, is more or is less*, etc., etc.; (2) by giving with all averages numerical measurements of the extent of variation from that average; (3) by making sure that our statements are based on representative data. It is a lamentable fact that the literature of child-study is almost bare of statements thus carefully made, and that consequently this book will have to be largely bare of them. That child-study has few exact statements as yet is due to the incompetence or thoughtlessness of its students, and not to the nature of the subject. Such a condition of affairs should be speedily overcome. In our next chapter, on the physical growth of children, we have one of the praiseworthy exceptions.

For practical work see Section 20.

3. THE PHYSICAL GROWTH OF CHILDREN

It would seem to be a simple matter to find out the rate of growth of children in general, the rate which is most desirable and the conditions which favor it. Yet no one has done so completely. We all have some idea of how much a child grows in his first or tenth or fifteenth year, of how big the majority of six or twelve or fourteen year olds are, of how great a deviation from this may properly excite alarm; but our ideas we shall find on examination to be extremely vague and uncertain. The scientific investigators of the growth of children are naturally better off in this respect, but they have by no means freed the subject entirely from vagueness or uncertainty.

Two ways may be taken to get an exact and sure answer to the questions, "Just at what rate do children grow, and what are the sizes they reach year by year?" Suppose we ask this question about children in America. We may take a group of individuals picked out at random and large enough to be representative of the class "all children in America," and watch them to see how they grow, that is, measure them from time to time, and note all the circumstances influencing their growth. This would seem to be the obvious way to solve the question, and it is now being used. But such a study must extend over a number of years before it becomes fruitful. A shorter method has therefore been adopted usually; namely, to take measurements of a great number of children of all ages. Suppose we have two or three thousand children of an average age of 5.5 yrs., two or three thousand of an average age of 6.5 yrs., and so on. We may say that the two or three thousand six and a half year old children represent what the five and

a half year olds would have become had we waited a year and measured them again. We find, for instance, the average height of 5.5 yr. old boys to be 105.90 cm.; of 6.5 yr. boys to be 111.58 cm. The difference between the average height of the 5.5 yr. and the 6.5 yr. children is therefore 5.68 centimeters, and we may say that the 5.5 yr. children would have grown on the average 5.68 cm. in their next year. We may make these statements, but we have no certain right to. For clearly we have taken no account of the fact that 6.5 yr. children in general do not represent 5.5 yr. children in general (after a year's growth), but *do represent* those of the 5.5 yr. children *who have not died*. If those who died were of average growth, it would make no difference in the figures; but if they were all small, our 5.68 would represent not the growth of the 5.5 yr. children in general, but of the taller among them. They would be absolutely sure to represent the growth of the healthier among them.

With these warnings against too hasty theorizing about growth on the basis of statistics of the sizes reached by groups of different ages, we may turn to an examination of some of these statistics.

The average heights of American boys and girls, with the mean variation from them, calculated by Dr. Franz Boas from all the available American material,¹ are as follows:

¹*Report of U. S. Commissioner of Education for '96-'97*, vol. ii, pp. 1541-1599.

TABLE 1.

| | Boys. | | Girls. | |
|------|-----------------------------------|---------------------------------|-----------------|---------------------------------|
| | Average Height in Centimeters. | Mean Variation. ¹ | Average Height. | Mean Variation. ¹ |
| 5.5 | 105.90 | ±(4.40) | 104.88 | ..... |
| 6.5 | 111.58 | " 4.66 | 110.08 | ±4.78 |
| 7.5 | 116.83 | " 5.00 | 116.08 | " 5.01 |
| 8.5 | 122.04 | " 5.34 | 121.21 | " 5.46 |
| 9.5 | 126.91 | " 5.48 | 126.14 | " 5.54 |
| 10.5 | 131.78 | " 5.74 | 131.27 | " 6.00 |
| 11.5 | 136.20 | " 6.20 | 136.62 | " 6.63 |
| 12.5 | 140.74 | " 6.62 | 142.52 | " 7.41 |
| 13.5 | 146.00 | " 7.54 | 148.69 | " 7.20 |
| 14.5 | 152.39 | " 8.49 | 153.50 | " 6.57 |
| 15.5 | 159.72 | " 8.61 | 156.50 | " 5.88 |
| 16.5 | 164.90 | " 7.63 | 158.03 | " 5.65 |
| 17.5 | 168.91 | " 7.15 | 159.14 | ..... |
| 18.5 | 171.07 | ..... | ..... | ..... |

It will be noticed that up to 11.5 years the girls are smaller than the boys of the same age, that from 11.5 to 14.5 years they are taller and from then on shorter. This is one of the phenomena connected with the period of adolescence, which comes earlier in the case of girls than boys. We see it more clearly in the following table of the differences in stature due to age:

TABLE 2.

DIFFERENCES BETWEEN THE AVERAGE STATURES AT DIFFERENT AGES.

| Difference between stature at | Boys. | Girls. |
|----------------------------------|-------|--------|
| 5.5 and 6.5 | 5.68 | 5.20 |
| 6.5 " 7.5 | 5.25 | 6.00 |
| 7.5 " 8.5 | 5.21 | 5.13 |
| 8.5 " 9.5 | 4.87 | 4.93 |
| 9.5 " 10.5 | 4.87 | 5.13 |

¹ This means that the chances are 2 to 1 that any child you may take of the age mentioned will not differ from the average given more than this amount, that two-thirds of children 5 to 6 are between 101.5 and 110.3 cm. tall, etc.

TABLE 2—*Continued.*

DIFFERENCES BETWEEN THE AVERAGE STATURES AT DIFFERENT AGES.

| Difference between stature at | | Boys. | Girls, |
|----------------------------------|--------------|-------|--------|
| 10.5 | " 11.5 | 4.52 | 5.35 |
| 11.5 | " 12.5 | 4.54 | 5.90 |
| 12.5 | " 13.5 | 5.26 | 6.17 |
| 13.5 | " 14.5 | 6.39 | 4.81 |
| 14.5 | " 15.5 | 7.33 | 3.00 |
| 15.5 | " 16.5 | 5.18 | 1.53 |
| 16.5 | " 17.5 | 4.01 | 1.13 |
| 17.5 | " 18.5 | 2.16 | .... |

We must not, however, hastily conclude from such a table that from 11.5 to 12.5 years all girls begin to grow $\frac{5.90}{5.35}$ times as much as they did the year before. If it be the fact, as seems likely, that "many individuals of retarded growth should die during the period of adolescence" we can account, at least in part, for the sudden jump in the amount of yearly difference at the oncoming of adolescence without supposing that it is due to a rapid increase in the rate of growth. For if death picked the small twelve-year-old girls, those measured would of course tend to be of a higher average height than the twelve-year-old boys where adolescence had not yet been reached and death had not picked so many small children.

Let us now ask concerning the general conditions that make a person attain to a certain stature. There are, first, inherited tendencies. The fact that we have men as ancestors decides that we shall, if we reach adult age, not be as small as rabbits or as big as elephants. It decides our general size as it does our shape. The particular race of men from which we spring further conditions our size, as it does our features. So, also, the fact that we have certain particular men and women as our immediate ancestors, decides to a large extent what particular height we shall have. Mr. Fran-

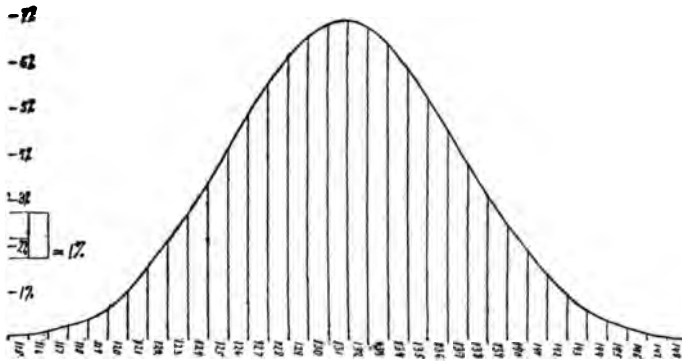
cis Galton has found that amongst the hereditary factors that decide stature the influence of the father and mother is half, and that of the four grand-parents one-fourth. Now the adult height to which we are growing partly determines the height we reach at any age, though to just what extent cannot be said. So one of the conditions deciding what stature a child at any age shall have is the stature of his parents. In the second place, the sex is clearly one of the conditions. In the third place, growth is conditioned by the nutrition of the body, by exercise, by disease, in short, by all agents which influence bodily functions in general.

If now we wish to tell whether these latter forces are doing their proper work, whether any child (or group of children) is growing at the rate he should, we must first allow for the influence of heredity. This we cannot do at all exactly, since we do not know to what extent small adult stature means a slower rate of growth. About all that we can do at present is to tell how far any single child's height deviates from the average height for his age, and use the information with extreme caution.

The average heights were given on page 23. Suppose that we observe five boys of 10.5 years old to be respectively 115, 120, 125, 130 and 135 centimeters tall. The average for that age is 131.78. The deviations are, therefore, respectively, -16.78, -11.78, -6.78, -1.78 and +3.22 cm. Which of these boys are dangerously under- or over-sized? We cannot say. We do not know just how far any individual may vary in point of size from the average of his race without danger. Nor, as we have seen, can we allow properly for heredity. What we can do is this: By examining the curve of frequency of statures of American boys 10.5 years old, we may find how common each size is at that age (see Fig. 2). There are, in fact, about 14 per cent. of 10.5-year-old children between 131 and 133 cm. (that is, within the two centi-

meters nearest the average. Now, within the two centimeters containing 115, there are about .2 per cent., that is, about 2 children in a thousand, compared with 137 or 138 in a thousand who are within the 2 centimeters at the average. Within the 2 cm. nearest 120 there are about 15 per thousand. Within the 2 cm. nearest 125 there are about 70 per thousand. Within the 2 cm. nearest 130 there are about

FIG. 2.



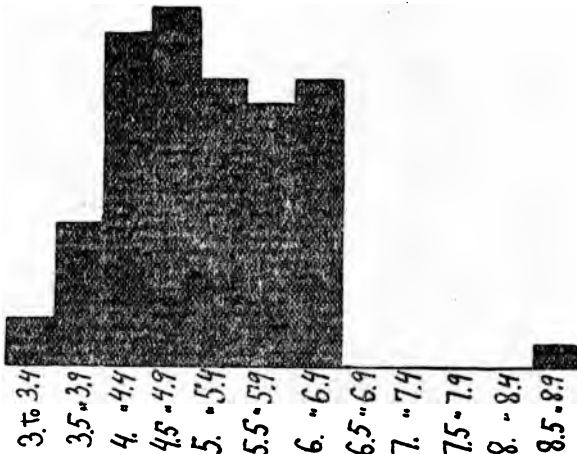
Statures of 10.5 yr. boys. The height at different points along the base line represents the percentage of boys of that age whose stature is, in centimeters, that stated in the figure at that point of the base line.

130 per thousand. Within the 2 cm. nearest 135 there are about 110 per thousand. There is, in fact, hardly any greater likelihood of a 10.5-year boy being right near the average height than of his being 1 or 2 or 3 centimeters away from it. As we go farther and farther away we find fewer and fewer cases, as the slope of the curve shows. But where to draw the danger-line and say, "This much undersizedness is abnormal, is dangerous," that we do not know enough to do. We might all agree that the 115-cm. child was dangerously under-sized, but as we go up the scale it is impossible to know where to stop.

The *rate* of growth is perhaps more significant of good or bad conditions. We can best use for comparison the tables of average increase gained by Dr. Boas from measurements made on children in Worcester, for here the same children were remeasured after a year's interval. (See Table 3.)

Suppose that our boys between the ages of 10 and 11 grew respectively 1.5, 3.5, 4.5, 5.5, and 7.5 cm. We find from Dr. Boas' table of the frequencies of increase from 10-11 (taken from 73 boys measured) (Table 4), that the

FIG. 3.



The heights at different points represent the percentage of boys whose growth during the year was in centimeters the amount given by the figures at that point.

average increase is 5.01 cm. and that in the 73 cases so small an increase as 1.5 does not occur and would very seldom be found among a thousand cases. Between 3 and 4 cm. there are 8 cases out of 73, that is, about 11%, between 4 and 5 there are 29 cases, that is, about 40%, between 5 and 6 there are 23 cases, that is, about 31%. Between 7 and 8 there are no cases out of the 73 and would probably be only a few out of a thousand. We see from the form of the curve

(Fig. 3) that increases of from 4 to 6.5 cm., are nearly as frequent as those of 5., but as we pass to much larger or smaller increases the percentage of individuals is much smaller. How far from the average (or most frequent) annual increase, any child's increase must be to be too much or too little for proper growth, once more we cannot say.

TABLE 3.
YEARLY INCREASE IN STATURE.
(The same individuals being remeasured at the end of a year.)

| | Boys. | | | Girls. | | |
|-------|-------------------|-----------------|------------------|-------------------|-----------------|------------------|
| | Average increase. | Mean variation. | Number of cases. | Average increase. | Mean variation. | Number of cases. |
| 5-6 | 6.55 | $\pm (1.57)$ | 8 | 5.75 | $\pm .88$ | 17 |
| 6-7 | 5.70 | $\pm .68$ | 41 | 5.90 | " .98 | 38 |
| 7-8 | 5.37 | " .86 | 63 | 5.70 | " 1.10 | 53 |
| 8-9 | 4.89 | " .96 | 66 | 5.50 | " .97 | 56 |
| 9-10 | 5.10 | " 1.03 | 79 | 5.97 | " 1.23 | 55 |
| 10-11 | 5.02 | " .88 | 73 | 6.17 | " 1.85 | 75 |
| 11-12 | 4.99 | " 1.26 | 72 | 6.98 | " 1.89 | 84 |
| 12-13 | 5.91 | " 1.86 | 77 | 6.71 | " 2.06 | 71 |
| 13-14 | 7.88 | " 2.39 | 60 | 5.44 | " 2.89 | 47 |
| 14-15 | 6.23 | " 2.91 | 32 | 3.34 | " 2.71 | 36 |
| 15-16 | 5.64 | " 3.46 | 18 | .... | .... | .... |

TABLE 4.
INCREASE IN STATURE OF BOYS DURING ELEVENTH YEAR—73 CASES.

| Increase in Cm. | Number of Cases. | Increase in Cm. | Number of Cases. |
|-------------------------|------------------|----------------------|------------------|
| 3.0-3.4 | 2 | 6.0-6.4 | 12 |
| 3.5-3.9 | 6 | 6.5-6.9 | 0 |
| 4.0-4.4 | 14 | 7.0-7.4 | 0 |
| 4.5-4.9 | 15 | 7.5-7.8 | 0 |
| 5.0-5.4 | 12 | 8.0-8.4 | 0 |
| 5.5-5.9 | 11 | 8.5-8.9 | 1 |
| Average increase, 5.02. | | Mean variation, .88. | |

It is a common opinion amongst physicians and students of children that small stature and a low growth-rate are in-

dicative of undesirable conditions in both body and mind. Many data point to that conclusion, though we have seen that we could find no precise statements that were certain. The conclusion is well enough supported to make us glad to see children of good size and average growth. But we should be careful not to feel too much surety that any individual undersized child is in a bad way, and should be even more careful not to jump hastily to some conclusion as to the cause. When a whole group of children, *e. g.*, the scholars in a boarding school, or the children of some slum district, or children employed in factories, rank below the average, we may well seek some definite cause, such as overwork, insufficient or improper food, etc.

What, briefly, may an educational worker profitably do in connection with the study of the physical growth of children? It would be highly desirable that in a large school system whose managers realize that they may profit enough from advances in the knowledge of children to sacrifice time and money to assist it, exhaustive studies be made of the growth of children from the time of entering school, and of the prevalence of (1) death, (2) disease, (3) dullness, (4) failure in life as shown by crime, pauperism, etc., and (5) of their opposites amongst children of different rates of growth. We should then know not only how growth does take place, but also of what its various forms are signs. The influence of physical culture on growth, of the four years high-school course, of different schemes of session hours, etc., may also profitably be studied.

An intelligent superintendent should at least try to make sure that the children in his charge are growing as much as the average in the country. He may also well make a hobby of some one of the particular questions mentioned above.

The teacher ought, in case no one else does, to watch intelligently any children exceptional in stature, say the small-

est and largest sixths, so as to gain at least a fair general impression of the ways in which they or some of them differ from the medium two-thirds. She ought also to know how much the children in her charge grow during the year, and to note as before any striking facts about the general behavior of the upper and lower sixths. But to be properly studied, growth must be studied on a large scale and with great care, and no teacher should indulge in general theories on the basis of her slight experience.

GENERAL PHYSICAL CONDITIONS AND PARTICULAR PHYSICAL DEFECTS

BODILY health and strength are ends in themselves, and if a teacher had charge of the entire bringing up of a set of children he would be sadly neglecting his duty if he did not look after their bodily welfare and hold himself responsible for it. Any teacher who takes no interest in the physical life of his class and never takes any measures to improve it, is at best one-sided. However, it is the parents who control the food, clothing, sleep, play and social life of children, and who consequently are almost entirely responsible for their health and strength. A teacher who can give one-twentieth to one-fortieth of his attention to a child for five hours out of twenty-four, five days out of seven, for nine months out of twelve, cannot, if he does anything else, watch very closely over the merely physical progress of his wards.

The bodily conditions of children possess for the teacher, however, apart from their intrinsic interest, an importance as means to mental welfare. Learning and conduct depend upon physical conditions, and their desirable forms are favored by bodily health, particularly of the nervous system. Certain bodily conditions then are relevant to the work of even that teacher who deals with children simply as learners. A few such conditions will be dealt with here.¹

When we say, as is true, that mental ability goes with bodily health, we do not mean that it always does, any more than when we say that weight goes with height, we mean that every six-footer will weigh more than every five-footer.

¹ Those who can properly afford to go into this subject farther should study some standard physiology and then some standard text-book of hygiene.

We mean that the average mental success of the healthy is above that of the unhealthy.

The physical condition of a pupil is, in the main, a product of two factors—the development his body has attained, and the way it is now being nourished. We may have defective development or defective nutrition. The condition of the brain in particular is shown, apart from conclusions drawn about it from knowledge of the body as a whole, by various symptoms; so we may add defective brain action. Dr. Francis Warner examined 100,000 school children in London, noting in each case defects of each of these sorts. His results are summed up in two tables (5 and 6),¹ which give us a fair notion of the frequency of these defects, the extent to which they go together and with dulness. In looking over these tables it will be well to turn the data into probabilities, *e. g.* to estimate roughly the chances that *any* child will be dull, that any *dull child* will be delicate (*i. e.* badly nourished). What, for instance, greater likelihood is there that a child with development defects and abnormal nerve signs will be dull, than that the average child will? In the tables “abnormal nerve-signs” is equivalent to our “defective brain action” above.

¹ *The Study of Children*, pp. 249, 250.

TABLE 5

Based on 50,000 children seen in day schools, mostly in or near London (1892-94); viz.: 26,287 boys, 23,713 girls. Showing the total number of children with each main class of defect and groups of defect, and the percentages on the number of children seen at all ages. The last column gives the number of girls per 100 boys per combined group.

| MAIN CLASSES OF DEFECT AND GROUPS OF DEFECT | NUMBER IN GROUPS | | PERCENTAGE ON NUMBER OF CHILDREN SEEN | | NUMBERS OF GIRLS PER 100 BOYS PER COMBINED GROUP | |
|--|------------------|-------|---------------------------------------|-------|--|------------------------|
| | Boys | Girls | Boys | Girls | On total examined | On total with a defect |
| | | | | | | |
| <i>A</i> All children with developmental defect | 2308 | 1618 | 8.8 | 6.8 | 78 | 95 |
| <i>B</i> All children with abnormal nerve signs | 2853 | 2015 | 10.8 | 8.5 | 78 | 96 |
| <i>C</i> All children with low nutrition | 749 | 770 | 2.8 | 3.2 | 114 | 140 |
| <i>D</i> All children mentally dull | 2074 | 1634 | 7.9 | 6.9 | 87 | 107 |
| <i>AB</i> All children with developmental defect and abnormal nerve-signs | 887 | 587 | 3.4 | 2.5 | 73 | 90 |
| <i>AC</i> All children with developmental defect and low nutrition | 374 | 428 | 1.4 | 1.8 | 127 | 156 |
| <i>AD</i> All children with developmental defect and mental dulness | 888 | 727 | 3.3 | 3.1 | 91 | 111 |
| <i>BC</i> All children with abnormal nerve-signs and low nutrition | 353 | 335 | 1.3 | 1.4 | 105 | 129 |
| <i>BD</i> All children with abnormal nerve-signs and mental dulness | 1195 | 860 | 4.5 | 3.6 | 80 | 98 |
| <i>CD</i> All children with low nutrition and mental dulness | 323 | 312 | 1.2 | 1.3 | 107 | 131 |
| <i>ABC</i> All children with developmental defect, abnormal nerve-signs, and low nutrition | 149 | 156 | 0.6 | 0.6 | 116 | 142 |
| <i>ABD</i> All children with developmental defect, abnormal nerve-signs, and dull | 403 | 303 | 1.5 | 1.3 | 83 | 102 |
| <i>ACD</i> All children with developmental defect, low nutrition, and dull mentally | 171 | 189 | 0.6 | 0.8 | 122 | 150 |
| <i>BCD</i> All children with abnormal nerve-signs, low nutrition, and dull mentally | 169 | 149 | 0.6 | 0.6 | 98 | 120 |
| <i>ABCD</i> All children with developmental defect, abnormal nerve-signs, low nutrition, and dull mentally | 80 | 79 | 0.3 | 0.3 | 109 | 134 |
| <i>EFG</i> All children with some defect not included in groups above | 336 | 323 | 1.2 | 1.3 | — | — |

TABLE 6

Based on 50,000 children seen in day schools, mostly in or near London (1892-94); viz.: 26,287 boys, 23,713 girls. Showing the co-relation or association of the main classes of defect observed in children.

The table is arranged in four columns, giving the percentages for children in the age-groups and at all ages. The percentages are taken on the number with the main class of defect.

Thus: Of all cases with developmental defect at all ages, 38.4 per cent. of the boys and 49.9 per cent. of the girls were mentally dull.

Of all the dull children at all ages, 57.6 per cent. of the boys and 52.6 per cent of the girls also presented abnormal nerve-signs.

| | 7 YEARS AND UNDER | | AGE 8-10 | | AGE 11 AND OVER | | ALL AGES | | |
|-----------|----------------------|-------|----------|-------|--------------------|-------|----------|-------|--|
| | Boys | Girls | Boys | Girls | Boys | Girls | Boys | Girls | |
| <i>A</i> | | | | | | | | | <i>All cases with developmental defect</i> |
| | | | | | | | | | Boys, 2308; girls, 1618 |
| <i>AB</i> | 31.7 | 28.5 | 43.3 | 41.4 | 40.5 | 44.0 | 38.4 | 36.2 | Per cent. with abnormal nerve-signs |
| <i>AC</i> | 22.7 | 35.0 | 16.0 | 22.1 | 7.5 | 15.0 | 16.2 | 26.3 | Per cent. with low nutrition |
| <i>AD</i> | 36.6 | 40.8 | 41.2 | 46.6 | 37.1 | 51.1 | 38.4 | 44.9 | Per cent. with mental dulness |
| <i>B</i> | | | | | | | | | <i>All cases with abnormal nerve-signs</i> |
| | | | | | | | | | Boys, 2853; girls, 2015 |
| <i>AB</i> | 35.1 | 41.2 | 30.6 | 28.0 | 28.3 | 21.4 | 31.0 | 29.1 | Per cent. with developmental defect |
| <i>BC</i> | 19.6 | 27.4 | 11.3 | 15.2 | 7.5 | 10.2 | 12.3 | 16.6 | Per cent. with low nutrition |
| <i>BD</i> | 43.3 | 47.0 | 42.6 | 41.9 | 39.6 | 40.4 | 41.8 | 42.6 | Per cent. with mental dulness |
| <i>C</i> | | | | | | | | | <i>All cases with low nutrition</i> |
| | | | | | | | | | Boys, 749; girls, 770 |
| <i>AC</i> | 52.5 | 66.1 | 51.0 | 50.4 | 39.3 | 35.5 | 49.9 | 55.5 | Per cent. with developmental defect |
| <i>BC</i> | 41.1 | 36.0 | 51.1 | 51.1 | 50.4 | 49.9 | 47.1 | 43.5 | Per cent. with abnormal nerve-signs |
| <i>CD</i> | 43.6 | 42.0 | 44.8 | 40.7 | 37.6 | 35.6 | 43.1 | 40.5 | Per cent. with mental dulness |
| <i>D</i> | | | | | | | | | <i>All dull children</i> |
| | | | | | | | | | Boys, 2077; girls, 1635 |
| <i>AD</i> | 45.9 | 55.1 | 43.3 | 42.6 | 38.6 | 34.9 | 42.8 | 44.4 | Per cent. with developmental defect |
| <i>BD</i> | 49.0 | 44.1 | 63.4 | 56.6 | 59.1 | 56.7 | 57.6 | 52.6 | Per cent. with abnormal nerve-signs |
| <i>CD</i> | 23.6 | 30.1 | 14.8 | 16.3 | 7.5 | 10.2 | 15.5 | 19.0 | Per cent. with low nutrition |

Dr. Warner makes the following statements: ¹

"The main classes of defect among school children include a larger proportion of boys than girls.

"The main classes of defect among school children are much associated in the groups of cases; such associations vary with age, sex and environment.

"Children with developmental defects often present also abnormal nerve-signs, and are delicate and dull.

"Children with indications of brain disorderliness, that is, abnormal nerve-signs, are often dull pupils.

¹ *Idem*, pp. 238-248, *passatim*.

"Dull pupils are often delicate, with indications of brain disorderliness, that is, abnormal nerve-signs.

"Girls with developmental defect or brain disorderliness are more apt to receive harm and less good from their environment than boys.

"The effects of good physical training in school are to diminish the number of cases with signs of brain disorderliness and the number of dull children."

Verify each of these from the tables, and tell in each case *how* "often" or *how* "apt" or *how much* "larger."

If it is worth while to know whether children have an inferior bodily development, it is worth while to know some of the simpler signs by which we can tell its existence. According to Dr. Warner, the following are the important ones which a teacher may detect:

Cranium too large, too small or ill-proportioned. For a seven-year-old child about 20 inches is the normal circumference of the head.

Cranium bossed; that is, with bony outgrowths.

Forehead defective; *i. e.*, narrow, low, generally undersized, bulging, or with a vertical ridge down its center.

External ear; the ears may stand out too far, the pleats and curled rim be absent, there may be asymmetry, the lowest part of the ear may be joined to the head instead of hanging below the lowest junction.

Epicanthis; a fold of skin or third eyelid across the nasal side of the eyeball.

The hard palate may be in horizontal section too narrow or too sharply pointed. In vertical section it may be too high or of irregular contour. It may be cleft.

Nasal bones may be "wide, sunken or indented."

Other developmental defects include a too small face, ill-proportioned features, hairy forehead, cold hands, a too small mouth, small or ill-shaped openings of the eyes.

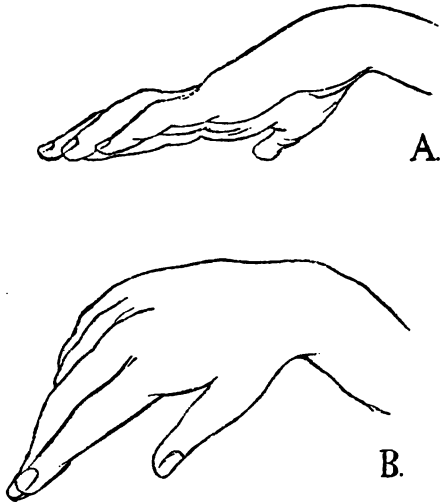
Some of the signs of defective nervous action are as follows:

General balance; unevenness or asymmetry in general posture.

Generally vacant or fixed expression of the face.

Over-action or uncontrolled action of muscles, *e. g.*, of the frontals, as shown by horizontal creases in the forehead; of the corrugators, as shown by vertical creases in the forehead;

FIG. 4.



A. Nervous Hand; B. Feeble Hand (after Warner).

of the muscles in the forearm and hand, as shown by finger-twitching; of the muscles that move the eyes, as shown in restless wandering eye movements.

Relaxed orbicularis oculi, shown by fullness or bagginess under the eyes. This may be a sign of more or less temporary brain exhaustion.

Hand weak or nervous. When a child with defective

brain action is asked to hold his hands out straight in front of him, his hands often take the position shown in Fig. 4. (See Warner, *Study of Children*, pp. 83, 111.)

Lordosis or, in a child taking the position just described, a marked deviation of the back from an erect attitude toward an obtuse angle. The child bends the lower part of his trunk too far forward and the upper part too far back.

Grinning, slowness in response to simple directions, and defective speech are other signs frequently associated with defective brain action.

The detailed signs of low nutrition, apart from such common ones as ordinary life familiarizes us with, can be learned from reputable medical books.

So much for the facts that may be observed concerning the general physical condition of school children and for the inferences which may be drawn from them. It is a question how far any teacher can herself profitably make such observations or rely on her own inferences from them. It would be unwise for any teacher without special scientific or medical training to pretend to competence in this field, and we should be very slow in basing prescriptions (*e. g.*, that a child leave school or take less work) on our own judgment concerning his physical condition. It is, however, to many an entertaining and to nearly all an instructive employment to attempt such observations, and if we can in any way secure expert assistance in correcting them, we may learn to be reliable observers. We may then at least know when to advise parents to consult a physician. Even our slight study in this chapter should serve to free us from the general blindness of teachers to these important factors in mental progress and to introduce us to a kind of child-study which is well worth serious attention. A superintendent or

principal might well afford the medical training necessary to efficient dealing with such problems.

Besides these general physical conditions there are particular defects of importance. The most notable amongst these, defects of sight and hearing, will be treated in the chapter on sensations. Others are—

1. Obstructions in the throat or nasal passages.
2. Epilepsy.
3. Chorea.
4. Rickets.
5. Ophthalmia.
6. Stammering.
7. Failure to move the eyes in reading.

Obstructions in the throat or nasal passages are always to be suspected in the case of children who habitually breathe through the mouth, though mouth-breathing may be a mere habit. Such cases should receive medical attention, as an operation is frequently desirable. Adenoid growths or enlarged tonsils not only prevent proper breathing, but may also cause deafness and indirectly dulness.

A typical epileptic fit shows the following symptoms: loss of consciousness, muscular convulsions, and congestion of the blood-vessels in the face. The attack may, however, be much less violent; in *petit mal* the child may simply become unconscious for a short time.

The epileptics may be of normal mental gifts. Apparently about two out of three are. "They need training with education," says Dr. Warner, "and do best when fully occupied in the country; to leave them untrained doing nothing through childhood is very unwise." It is important to take some practical measures to prevent an epileptic child from having a fit in the presence of the class, not only because of

its disagreeableness, but also because the force of suggestion may produce epileptic symptoms in the other children.

Of chorea Dr. Warner says:

"Chorea, or St. Vitus's dance, is frequent during school age, and is more common among girls than boys. This occurs in some of the bright, well-made children; it is characterized by weakness and a number of awkward twitches and movements, while the girl becomes somewhat childish in manner. The onset is usually gradual, the girl becomes clumsy, things drop from her hands, as the fingers open spontaneously; the hand when held out assumes the nervous posture, while the fingers twitch; there may be facial grimaces, usually about the mouth, and the eyes are much moved; the shoulders may often be drawn up and down, and other abnormal nerve-signs are observable. Though many spontaneous movements thus occur, they are at first partially under control, and momentary quietness may be produced by arresting the child's attention. These children have often suffered from rheumatism or pains in the joints and limbs, with some swelling of one knee after fatigue or what is vaguely called "growing pains"; another important point is that these children are almost always below their normal weight, often losing a pound in weight or more in a week.

"A girl thirteen years of age, in Standard VI., after a slight attack of sore throat, became very irritable; she was unable to write properly or hold her book straight, and began to drop things from her hands. She left school, but was not laid up. When seen at the hospital, her weight was much below the normal; when she held out her hands, there was much movement seen at the elbows and wrists, while the fingers twitched; imitation of movements was fairly performed, but with many extra movements, not controlled through her eyes. At the end of a month's treatment she had gained four pounds in weight, and the movements subsided; she made a good recovery."

If a teacher has good reason to suspect the presence of this disease in a scholar, he should of course confer with the parents.

Children afflicted with rickets are likely to be stunted in growth, with large, ill-shaped heads, and "pigeon-breasted." According to Dr. Warner about one-third of them are dull.

Ophthalmia is a contagious disease of the eyes. A full description may be found in any text-book of diseases of the eye. The teacher who notices a child with an effusion from his eyes should ask the parents to consult a physician, and should notify the principal of the school.

The phenomena of stuttering are well known. They are essentially a spasm of certain muscles and a diffusion of the motor impulse to larger and larger groups of muscles. About one child out of one hundred and thirty stutters. Boys are three times as likely to stutter as girls. The handiest practical method of dealing with stuttering in school is to stop the pupil at the beginning of an attack.¹

A very slight defect which may cause a disproportionate amount of mental difficulty is the habit of moving the head instead of the eyes. Movements of the head are too gross to suffice for the fine discrimination necessary in reading foreign languages, following numerical work, etc. This habit then may result in a specious dullness on the part of the pupil, as in the following case from Warner's "Study of Children," p. 2.

"A boy of eight years of age, in a preparatory school, was said to be so dull at learning Latin, that it was thought impossible to continue the attempt to teach him. He was healthy and well made; he showed no signs of mental defect, and was otherwise quick and bright. He had learned to read well, and read story-books for pleasure. I noticed that, in reading, he followed the words on the printed lines by moving his head, not moving his eyes in their orbits; this did well enough for story-reading, when he skipped much of the page. Moving the head, in place of turning the eyes, did not admit of sufficient accuracy for studying Latin. Some attention to eye-drill soon removed all the difficulty complained of and the boy made good progress."

The practical advice given on page 37 applies equally well to the teacher's actions with respect to these minor physical defects.

For practical work see section 20.

¹ For the authorities for these statements see the convenient account of stuttering in Kotelman's *School Hygiene*, English translation by Bergstrom and Conradi, p. 307.



5. UNLEARNED REACTIONS

So far we have studied a few of the more important facts for us as teachers about the bodily constitution of children, their physical growth and the general physical conditions of successful conduct. We have also learned some ways to train ourselves to be better observers of children's bodily actions, and have seen some of the problems concerning physical development which the thoughtful teacher will have in mind.

No sensible person will neglect any chance to improve children's physical condition whenever it is practicable to do so; but the teacher who has charge of children but five hours out of twenty-four for five days out of seven, who has no control over what they eat or wear, how long they sleep, or how they play, cannot be expected to be the guardian angel of their physical development. Under present conditions her main business is to improve their mental and moral make-up, their intelligent conduct, rather than their bodily health. We therefore turn to our main topic, the mental life of children.

What a child does at any time, what he says or writes, where he goes, how he eats, studies, plays, works, etc., etc., may be expressed as a reaction to a situation. We learned to think of human conduct in these terms in our study of general psychology.¹ We found also that a person's reactions might be (*a*) unlearned, that is, due to the capacities which he inherited, or (*b*) learned, that is, acquired by him during life. The learned reactions we divide into (1) those due to a process of gradual selection of the successful act, a

¹ See James' *Talks to Teachers* or Thorndike's *Human Nature Club*,
237]

process of "trial and success," (2) those due to imitation, and (3) those due to the presence of ideas of one sort or another.

We naturally begin our study of children's conduct by a consideration of their unlearned reactions, of what they have as a gift of nature, as the capital which they can use in life.

UNLEARNED OR NATIVE REACTIONS OR INSTINCTS.

It would be of great value to have a complete list of all the different reactions which human beings make without tuition, but there is no such. The following are representative ones, and include those which we need to bear in mind.¹ There is some question as to how far those marked with a D are instinctive.

1. The common physiological functions, such as breathing, sleeping, digesting, etc., etc.

2. All the so-called "reflexes," such as sneezing, snuffing, snoring, coughing, sighing, sobbing, gagging, vomiting, hiccuping, starting, moving the limbs when tickled, touched or blown upon, etc., etc.

3. Sucking.

Biting an object placed in the mouth.

Chewing and grinding the teeth.

Licking.

Making characteristic grimaces over bitter and sweet tastes.

Spitting.

Clasping things which the palm of the hand touches.

Grasping at certain objects, *e. g.*, small, bright, or moving objects.

¹ This list is taken in the main from James' *Principles of Psychology*.

Carrying to the mouth the object when grasped.

Pointing.

Making a peculiar sound expressive of desire.

Crying.

Protrusion of the lips.

Turning the head aside.

Holding head erect.

Sitting up.

Standing.

Creeping.

Walking.

D. Following objects going away slowly.

D. Running from objects coming toward the child fast.

Climbing.

Vocalization; that is, the general babbling of infants.

Emulation or rivalry; that is, the tendency to do what others are doing in such a way as to get what they get.

Pugnacity.

Resentment.

D. Sympathy.

The hunting instinct; that is, the tendency to catch, play with, and tease small living things.

General physical activity; that is, the general tendency to move in all sorts of ways, not to keep still, to do things to things.

General mental activity; that is, fondness for having ideas, pleasure at the presence of feelings or thoughts, delight in mere thinking irrespective of the consequences.

Fear of noises.

Fear of strange men and animals.

Fear of black things.

Fear of the dark.

Fear of open places.

Fear of high places.

D. Fear of spiders and other vermin.

D. Fear of snakes.

Fear of solitude.

Acquisitiveness; that is, the tendency to take what one sees.

Miserliness; that is, the tendency to keep what one takes, to resist attempts to take away anything one has had about him.

Fear of exposure; that is, the tendency to feel comfortable and to repose when sheltered.

D. Cave dwelling.

Play.

D. Constructiveness.

Curiosity.

Secretiveness.

D. Cleanliness.

D. Modesty.

D. Shame.

Love.

Jealousy.

Go over this list picking out those of most importance for school life, those of importance for special branches of study (*e. g.*, manual training), and those which seem to show a kinship between man and the lower animals.

We should recall that instincts may be delayed or may be transitory. To say that a certain ability or tendency is in an animal apart from teaching or experience, is born in him, is not to say that at birth he possesses it or that all through life he keeps it. We should also be careful not to

imagine that an instinct is any hard-and-fast, immutable thing. Our instinctive behavior is often modifiable to the highest degree. The force of habit strengthens our instincts when we repeat any instinctive performance, so that the later manifestations of the instinct are half habit. Moreover, that we have an instinct does not mean that we have to have it, for we can abolish them or change them. The child who instinctively grabs quickly at every apple he sees can be taught not to grab at all or to reach out his hand as gently as etiquette demands. The boy who instinctively reacts to a blow by striking out wildly with his fist may be taught to strike out with the science of the trained pugilist, or not to strike at all. We can thus strengthen, direct or inhibit instinctive reactions.

From what we have learned it is clear that it is foolish to waste time trying to teach a child something that will soon enough come as a delayed instinct. For instance, the child walks first bow-legged, with the soles of his feet turned in, but later comes instinctively to walk with legs straight. It is said that children may even be injured by premature attempts to induce them to walk straight. It is also folly to expect children to be free from their unavoidable heritage of greed, random activity, pugnacity, etc., or to regard such activities as moral perversions, or as the results of bad training. Since instincts may wane if not given suitable opportunities to display themselves, we may to some extent perpetuate those we desire and abolish those we dislike by providing or withholding the stimuli that arouse them into action. We may inhibit them even when they are not inherently transitory, either (1) by previously forming the habit of meeting the situation in some other way, or (2) by so arranging the circumstances that the instinctive act results in discomfort.

The training of animals offers even better illustrations

than the training of children. An instance of the former sort is found in the history of a cat which learns to pull a loop and so escape from a box whose top is covered by a board nailed over it. If, after enough trials, you remove a piece of the board covering the box, the cat, when put in, will still pull the loop instead of crawling out through the opening thus made. But, at any time, if she happens to notice the hole, she *may* make use of it.

An instance of the second sort is that of a chick which has been put on a box with a wire screen at its edge, preventing her from jumping directly down, as she would instinctively do, and forcing her to jump to another box on one side of it and thence down. The chick tried at first to get through the screen, pecked at it and ran up and down along it, looking at the chicks below and seeking for a hole to get through. Finally, it jumped down by the round-about way. After enough trials it formed the habit of doing so. Now if, after seventy-five or eighty trials, you take away the screens, giving the chick a free chance to go down directly, the following phenomenon appears. The chick goes up to the edge, looks over, walks up and down it for a while, still looking down at the chicks below, and then goes down by the round-about way. No matter how clearly the chick sees the chance to jump down directly, it does not do so. The impulse has been truly inhibited. It is not the mere habit of going the other way, but the impossibility of going *that* way.

Many of the phenomena manifested by abnormal children are cases of exaggerated or perverted instincts. For instance, in so-called moral insanity—that is, in those prodigies of brutality who torture and murder other children—we have cases of exaggerations of the normal instincts to tease and mutilate.

6. LEARNED REACTIONS

LEARNING BY TRIAL AND ACCIDENTAL SUCCESS.

THE reader of "The Human Nature Club" is already familiar with the general facts about learning by "trial and success." We change our reactions to various situations, that is, learn, without thinking about them or getting new ideas about them. This is done (*e. g.*, in learning to ride a bicycle) by the elimination (generally gradual) of the useless acts and the reinforcement of the successful ones. (See Human Nature Club, pp. 29-31, 38-40.) Now this method of learning is more characteristic of children than of adults. Children learn in this way things which we would learn by ideas. Probably they learn in no other way up to about nine months. Some dull children can be taught in this way when the ordinary methods fail.

All through life we continue to use this method of learning in many cases. Amongst school subjects such things as control of tools, holding the pen correctly, improvement of hand-writing after the forms of the letters are learned, pronunciation and singing, are learned largely by this gradual selection of the successful movements. In such cases the work of the teacher is naturally to stamp out the failures by making the pupil feel uncomfortable at them and to stamp in the successes by approval, by making the pupil himself care, etc. Moreover, this must as far as possible be done at or near the time of the performance. We must remember that mere repetition, mere practice of these acts, is as likely to make them worse as better. Drill is of value only when the *right* thought or movement becomes more and more closely associated with the situation. The old copy-book writing,

for instance, when done by a boy who did not feel pleased when he wrote well or bad when he wrote ill, resulted in little or no improvement; the last line on the page was often the worst.

LEARNING BY IMITATION.

Children are notoriously imitative beings to an extent unnoticed in adults. We are here concerned with only one set of facts from among the many often referred to by the word imitation, namely cases of learning by imitation, cases where seeing a thing done or hearing a thing said gives any one the ability to do it. Other facts of imitation we will discuss under the heading "Suggestion."

Children learn by imitation more than do adults. We shall not be viewing children aright, however, if we stop here and suppose that in some mysterious way some faculty of imitation is more strongly at work in them than in adults. If we look more closely at the facts we see that the ideas of sights, sounds and movements, the notions of the meanings of words, the habits of attention to spoken and printed instructions which enable us to learn from the explanations of people and of books, have not been acquired by children. It is a rudimentary performance to learn to bang on a drum from seeing another boy do so; the child has the ideas of the movements and of the resultant sounds directly. But for one to learn the same act from hearing some one say, "You take those two long cylinders of wood and that thick cylinder with a membrane over each end and, holding the latter between your knees and the former, one in each hand, and grasped by all the digits, beat them alternately against the surface of the membrane," would require a lot of verbal knowledge.

Again, older people have already learned those simple

acts, words, etc., needed for ordinary intercourse which are the common possession of every one, and which can be learned from watching any one; they have passed on to the learning of acts that are not universally performed, such as doing chemical experiments, office work, learning mathematics, etc., etc. They are learning abstract matters which are not particular and imitable but are general or symbolical. There is not much for them to learn by imitation, because that which was needful and could be so learned, they have already learned. Children, we just said, often could not learn by explanation because they did not have the store of knowledge; conversely adults do not learn by imitation because they have already learned what could be so learned.

Finally, even when children are capable of learning a thing by getting ideas about it, they often do not, because the old habit of watching for actual demonstrations of the act sticks. They have to get used to their new abilities.

LEARNING BY IDEAS.

The more complicated processes, such as are involved in solving a problem in arithmetic, translating a sentence or learning a geography lesson, demand separate treatment. Our next chapters will therefore be devoted to them. They evidently involve all the mental processes and factors concerned in acquiring and using ideas.

7. SENSE-PERCEPTION

IN order that a child may react to any situation, respond to any stimulus, either instinctively or as a result of learning, he must feel it, be sensitive to it. If he did not see the ball, the child would not reach for it; if he did not hear the thunder, he would not be afraid; if he did not feel the ground under the soles of his feet, he would not walk; if the teacher's questions did not arouse sensations of some sort, he would not reply.

Children are born with certain sense-powers, and these develop as the child grows. We have to ask, therefore, under the heading *Sensation*, "What are children's sense-powers at the start, and how do they change with advancing years?" In the case of any single child or special group of children, we have to ask, "Are the sense-powers of normal development in respect to the number of senses and the range and delicacy of each?"

The normal sense-equipment of new-born children and normal amount of development in the first three or four years of life are matters of interest to students of theoretical psychology and to parents, but they need not concern us here. A summary of the facts is given on pp. 1-42 of Tracy's "Psychology of Childhood," and an interesting sample of investigations along this line is that on "The Order of the Development of Color-Perception," by Holden and Bosse, in the "Archives of Ophthalmology," vol. xxix, No. 2, 1900.

If we ask how the sense powers of children of school age are changing, we find that with boys and girls from 6 to 16 years of age there are, of course, no new senses added and no notable differences in range, but that there are de-

cided differences in delicacy of discrimination as the children grow. Gilbert¹ tested approximately 100 children 6-7 years old, 100 7-8, etc., and found that in the perception of weight the delicacy of children 13 years and older was over twice as great as that of children 6 to 7. In making these tests the children were given 10 weights that looked alike, but weighed 82 g., 84 g., 86 g., 88 g., etc. The 82 g. weight, marked with a white spot, was given to the child, and he was told to sort out all those which seemed to him to be of exactly the same weight as the one with the white speck. The number of grams difference in weight required for the child to notice a difference gives an inverse measure of his ability to discriminate. The average number of grams for the different ages is given in the column headed D, of Table 7. The figures given under the column headed MV are the mean variations for each age; that is, the probability is two to one that any boy or girl 17 years old will require a difference of between 3.2 and 8.4 grams; any boy or girl 16 years old a difference of between 4.2 and 9.0, etc., etc.

The column headed P gives the percentage of children of each age who failed to state that *any* of the weights were greater than the 82 g. standard:

¹Yale Studies, Vol. I, pp. 80-87; Vol. II, pp. 40-100. The method used in this research was faulty in some respects; but the results are probably fairly accurate.

TABLE 7.—DISCRIMINATION OF WEIGHTS.

| AGE. | D. | P. | MV. |
|----------|------|----|-----|
| 6 | 14.8 | 38 | 5.2 |
| 7 | 13.6 | 36 | 4.4 |
| 8 | 11.4 | 30 | 4.6 |
| 9 | 10.0 | 20 | 4.4 |
| 10 | 8.8 | 12 | 4.4 |
| 11 | 8.6 | 6 | 3.8 |
| 12 | 7.2 | 3 | 3.0 |
| 13 | 5.4 | 2 | 3.0 |
| 14 | 5.6 | 0 | 3.0 |
| 15 | 6.8 | 0 | 2.2 |
| 16 | 6.6 | 1 | 2.4 |
| 17 | 5.8 | 1 | 2.6 |

The change in the power of discriminating color is shown in Table 8.

The nature of the test is described by Dr. Gilbert as follows :

"This test consisted of a series of ten shades of red so closely graded that no two successive colors or shades could be distinguished except by an experienced eye. Ten pieces of woollen cloth of fine texture were first dyed a suitable red by a practical dyer under my supervision. After the ten pieces were removed from this coloring solution, which left them all exactly of the same color, a very small portion of dye was added to the boiling vat, thus making the fluid slightly darker. One of the pieces was again boiled in this, making it, when removed, very slightly darker than before. To this last solution was again added a small portion of dye in which a third piece was boiled, and so on, adding for each successive piece of cloth an equal portion of dye, and giving thus a series of shades each differing from the others in a very slight degree. In taking the tests the block containing the lightest shade, painted white on the bottom to distinguish it, was used as the standard with which to compare the rest. The child was given a box containing one set and told to pick out all those shades of red which were exactly like the one painted white on the bottom."

The column D represents the average amount of difference in color required in order that the children of the ages mentioned should make the distinction. Children from 13 on are here as before of twice as delicate discriminative power.

The column headed MV has the same meaning as in Table 7. Some children did not state that any one was unlike the lightest, which was shown as a standard. The percentage of children of each age who did so is given in the column headed P.

TABLE 8.—DISCRIMINATION OF COLOR.

| AGE. | D. | P. | MV. |
|----------|-----|----|-----|
| 6 | 9.6 | 57 | 1.8 |
| 7 | 9.0 | 49 | 2.1 |
| 8 | 8.3 | 44 | 2.3 |
| 9 | 6.3 | 23 | 2.2 |
| 10 | 5.4 | 11 | 1.9 |
| 11 | 5.4 | 4 | 1.7 |
| 12 | 5.1 | 3 | 1.5 |
| 13 | 4.6 | 4 | 1.7 |
| 14 | 4.7 | 3 | 1.4 |
| 15 | 4.4 | 1 | 1.1 |
| 16 | 4.3 | 1 | 1.3 |
| 17 | 3.9 | 3 | 1.4 |

Dr. Gilbert also tested the sensitiveness to pitch of five boys and five girls of each of the ages noted in the table save 18 and 19. In the table, D represents, in 32ds of a tone, the average amount of difference necessary in order that children of the age mentioned shall tell one tone from another.

TABLE 9.—DISCRIMINATION OF PITCH.

| AGE. | D. | AGE. | D. | AGE. | D. |
|--------|------|---------|-----|---------------|-------------|
| 6..... | 12.3 | 10..... | 6.2 | 14..... | 3.5 |
| 7..... | 9.1 | 11..... | 4.8 | 15..... | 5 |
| 8..... | 6.8 | 12..... | 4.1 | 16..... | 4 |
| 9..... | 4.8 | 13..... | 3.7 | 18 and 19 ... | 2.6 and 2.4 |

It is one thing to find that the delicacy of sense-discrimination increases with age, and a different thing to tell to just

what the increase is due. The change may be like the change in height and weight. If that were the case, we should secure proper improvement in sense-discrimination by securing good bodily nutrition. It may be the result of exercise of the sense-organs involved, be due, that is, to experience of tones, weights, etc. We should then find that ~~no~~ matter how healthily a person grew, he would not improve in his sense-powers save in so far as he was trained. The results quoted from Dr. Gilbert may conceivably not be due to improvement in the senses at all, but simply to improvement in the power of attending to the sensations judged, and in general ability to understand the nature of the tests and to express one's meaning. The rapid improvement from six to eight years gives some plausibility to this explanation. Finally, a combination of these different explanations may be the true one.

[How could we find out just how much of the change in the delicacy of discrimination was due to mere natural development, how much to training, how much to increase in general intelligence?]

So much for delicacy of discrimination in children in general. We have left our third question, "Has any child or any group of children with whom we are concerned sense defects of importance for us to know?"

First, is any sense lacking? This is, of course, easy to discover. Total blindness, total deafness, and insensibility to tastes or smells or touch are not left for the teacher to detect. Nor does the ordinary teacher have to deal with such cases. The question of the special methods of treatment appropriate to them is most interesting, and any student of child-psychology should take pains to visit schools for the blind and deaf.

Secondly, is any sense injuriously below the normal in delicacy? A teacher can do no surer service to a scholar

than to discover for him any defects in vision or hearing which he may possess. Early warning may lead to a cure or to the prevention of the defect from growing worse, or it may lead to simple measures for relief in the school-room. [What would they be?]

Further, the appearance of mental incapacity, of dulness, and even of perversity, may be really due to a sense-defect as in the following case:

"I recall in this connection the case of a clergyman's young daughter, who was sent home with a note from the teacher in one of our public schools. An hour later the distressed father brought his child to me and placed the note in my hand. The extraordinary advice was given to place the child under special training, since she had not the mental capacity to get on at school. It is but fair to add that this occurred seventeen years ago. I found the child with only $\frac{1}{20}$ of normal acuity of vision because of a very high grade of astigmatism. She could not see enough to learn the alphabet. This was corrected by a pair of cylindrical glasses, and the poor child at once proved her capacity to learn and keep up with her class."¹

By simple examination of the vision and hearing of school children, with consequent reseating, the mental progress of school children may be measurably improved.

In a class of thirty children from 6-8 years old, whose parents are not decidedly above the average in intelligence and care, a teacher may be reasonably sure of finding some scholar with a sense-defect which hampers his work without his being fully or perhaps at all aware of it. Little children have been found with only $\frac{1}{20}$ normal acuity of vision, who did not know that anything was the matter with their eyes. They naturally suppose that to every one as to them the letters on the board are faint and blurred and hardly to be deciphered, and so they make no complaint. It is the obvious duty of every teacher capable of doing so, to test the eyesight and hearing of every child who has not previously

¹ S. D. Risley, *Educational Review*, vol. 3, p. 248.

been so tested, and to repeat the tests to make sure that the children are not suffering from school conditions.

A great deal has been said concerning the disastrous effect of school-life upon the eyes. It is a question whether merely using the eyes as much as the ordinary school course demands is injurious, or whether the bad light, bad air and bad posture so common in school-rooms are to blame. It is a fact that school-life in general causes near-sightedness in children.¹ These cases of increase in the defects of vision with the progress of school-life may be due to improper school hygiene rather than to the mere work required of the eyes by prolonged study.

Dr. W. A. Mowry says (in the Proceedings of the N. E. A. for 1898, page 365):

"I have in mind a private school for boys between the ages of ten and twenty years. A new school-house was built, with due regard to the proper conditions of lighting. There were in the school from 200 to 250 boys. An eminent oculist made a record of the condition of the eyes of these pupils. Two years later he again examined the eyes of all then remaining who were in the school at the former examination. Two years after that he made a third examination. Here was an intervening period of four years, and this record showed that, with the exception of a few cases of astigmatism, the eyes of these boys were universally *in better condition* than at the beginning of this period.

"Still further, he found that where astigmatism existed—which generally increases at the age of these youth—its increase had been less than is usually found to be the case. These experiments showed clearly that, with a large number of youth under proper hygienic conditions, the eye-sight may be improved, although the attention of the pupils is steadily and persistently confined to text-books. In this case, perhaps one-half of the boys were pursuing the study of Latin, and many of them also Greek."

Defective hearing is not so important an evil in school as defective vision, for as it is a more obvious defect than the latter, it is more likely to be known to the child and his

¹The class may read the chapter on "Eye-sight," in Kotelman's *School Hygiene*.

parents, and so provided for. Moreover school-life and unhygienic administration of the school studies do not to any considerable extent increase defects of hearing. It is, however, profitable to test the hearing of school children. One ear may be very defective without the individual or his friends or teachers noticing it, and young children have been found who were very deaf, the results of their deafness having been unnoticed or credited to inattention or stupidity. Knowledge of the defect leads to its cure or restriction, or at least to the adaptation of school conditions to the child in question. Adenoid growths have already been mentioned as a frequent cause of deafness in young children. (See page 38.)

Color blindness occurs in about one boy out of every twenty-five, and in about one girl out of one hundred and twenty-five. If a scholar is slow or incorrect in picking out countries on a map, or objects of any sort designated by their color, or if he is notably deficient in work with water colors, it will pay to test him, or have him tested for color-blindness.

8. APPERCEPTION

It is a trite maxim in teaching that we must proceed from the known to the unknown. Of course, if we proceed at all, we must proceed that way. The reception which any stimulus meets with in a child's mind depends on his past experiences. And it is self-evident that children in general differ from adults in general, just as adults differ among themselves, in respect to the quantity and quality of their experiences and of the knowledge gained therefrom. Until one has taught or managed children for some time he can hardly realize their ignorance of many of the matters which we adults have known so long that we take knowledge of them for granted. And unless we are especially adroit in gaining insight into our scholars' minds, we are always likely to underestimate their ignorance.

Some common instances of such error are:

(1) Presupposing that the knowledge of the common objects of every-day life which we possess, is the possession of young children, *e. g.*, that they know that milk comes from cows, that flour is made from wheat, that a city has more people than a town.

(2) Presupposing that young children have had experience of and remember the real things denoted by common words which they perhaps use, *e. g.*, that when they use or hear the words pond, river, brook, butterfly, corn, elm trees, etc., they feel the real meaning of the word, or could at will recall any actual example.

(3) With older children, presupposing that the use of verbal definitions, etc., implies a knowledge of concrete phenomena or properties, *e. g.*, that the boy who defines

base-level, flood-plain, etc., etc., would know one of them when he saw it.

We need not multiply instances, as not only in teaching but also in attempts to buy and sell, persuade and reform, in fact all through life, we find that failure to estimate rightly the mental status of the man you are dealing with leads to failure to get on with him.

There are no general statements that can profitably be made concerning the amount and quality of knowledge in children's minds at different ages. It is, of course, in each case a separate problem to find out just what you can depend on in that child. Nor is there any royal road to finding that out. One will do it better if he tries than if he does not try at all, and systematic tests, inventories, so to speak, of the contents of the minds of the children in any class, may prove worth while. The living appreciation of a child's mental standpoint gained from intelligent intercourse with him cannot, however, be replaced by any such formal record. In the case of large groups of children, *e. g.*, city children *vs.* country children, children brought up in institutions *vs.* ordinary children, children trained in kindergartens *vs.* children left at home, such formal records will be of very considerable value, as they will enable the teacher to know in advance that certain knowledge or ignorance characterizes certain classes of children. Such records will have the additional value of helping us to estimate the work of different educational systems; for they will serve as at least a partial measure of the amount of available knowledge the children in question have gained.

As a sample of such a record we may quote from Dr. G. Stanley Hall's investigation of the "Contents of Children's Minds on Entering School." The children here were Boston children. The figures given in the table represent the percentage of children who were ignorant of the com-

mon objects or facts stated. The table, that is, should be read as follows: 80 per cent. of ordinary Boston children do not on entering school know what a bee-hive is; 77 per cent. do not know what a cow is, etc. The full account of the investigation is well worth reading (see Pedagogical Seminary, vol. i, pp. 139-173.)

| | | | |
|----------------------------|------|-------------------------------|------|
| bee-hive | 80 | dew..... | 78 |
| crow | 77 | what season it is..... | 75.5 |
| bluebird | 72.5 | seen snail..... | 73 |
| ant | 65.5 | seen rainbow..... | 65 |
| squirrel..... | 63 | seen sunrise..... | 56.5 |
| snail | 62 | seen sunset | 53.5 |
| robin | 60.5 | seen clouds | 30.5 |
| sparrow | 57.5 | seen stars..... | 14 |
| sheep | 54 | seen moon..... | 7 |
| bee | 52 | conception of an island | 87.5 |
| frog | 50 | conception of a beach | 55.5 |
| pig | 47.5 | conception of a wood | 53.5 |
| chicken | 33.5 | conception of a river | 48 |
| worm | 22 | conception of a pond..... | 40 |
| butterfly | 20.5 | conception of a hill | 28 |
| hen | 19 | conception of a brook | 15 |
| cow | 18.5 | conception of a triangle..... | 92 |
| growing wheat | 92.5 | conception of a square..... | 56 |
| elm tree | 91.5 | conception of a circle | 35 |
| poplar tree..... | 89 | the number five..... | 28.5 |
| willow | 89 | the number four | 17 |
| growing oats..... | 87.5 | the number three | 8 |
| oak tree..... | 87 | seen watchmaker at work | 68 |
| pine | 87 | seen file | 65 |
| maple | 83 | seen plough..... | 64.5 |
| growing moss | 81.5 | seen spade..... | 62 |
| growing strawberries | 78.5 | seen hoe | 61 |
| growing clover | 74 | seen bricklayer at work | 44.5 |
| growing beans..... | 71.5 | seen shoemaker at work | 25 |
| growing blueberries | 67.5 | seen axe | 12 |
| growing blackberries | 66 | knows green by name | 15 |
| growing corn..... | 65.5 | knows blue by name..... | 14 |
| chestnut tree | 64 | knows yellow by name | 13.5 |
| planted a seed..... | 63 | knows red by name | 9 |

| | | | |
|-----------------------------------|------|-------------------------------------|------|
| peaches on a tree | 61 | that leathern things come from | |
| growing potatoes | 61 | animals | 93.4 |
| growing buttercup | 55.5 | maxim or proverb | 91.5 |
| growing rose | 54 | origin of cotton things | 90 |
| growing grapes | 53 | what flour is made of | 89 |
| growing dandelion | 52 | ability to knit | 88 |
| growing cherries | 46 | what bricks are made of | 81.1 |
| growing pears | 32 | shape of the world | 70.3 |
| growing apples | 21 | origin of woollen things | 69 |
| where are the child's ribs | 90.5 | never attended kindergarten | 67.5 |
| where are the child's lungs | 81 | never been in bathing | 64.5 |
| where is the child's heart | 80 | can tell no rudiment of a story .. | 58 |
| where is the child's wrist | 70.5 | not know wooden things are from | |
| where are ankles | 65.5 | trees | 55 |
| where is waist | 52.5 | origin of butter | 50.5 |
| where are hips | 45 | origin of meat (from animals) ... | 48 |
| where are knuckles | 36 | cannot sew | 47.5 |
| where are elbows | 25 | cannot strike a given musical tone. | 40 |
| knows right and left hand | 21.5 | cannot beat time regularly | 39 |
| knows cheek | 18 | have never saved cents at home .. | 36 |
| knows forehead | 15 | never been in the country | 35.5 |
| knows throat | 13.5 | can repeat no verse | 28 |
| knows knee | 7 | source of milk | 20.5 |
| knows stomach | 6 | | |

The intelligent teacher will manage somehow to make a practical diagnosis of the extent of a scholar's experience along any line, and the intelligent reader of this book ought to be able to think out from our introductory statement the different cases in which the amount of a child's equipment is a question to be answered. Still, so many text-books and so many teachers grossly err in this respect, that it may pay to recall some samples besides those given by President Hall's study. Our second point, on page 58, may be amplified here. It is a common error to suppose that because children use a general term freely, they know its connotation or denotation at all exactly. Children may talk about rivers or countries, or farmers or butterflies, without having had any adequate experience of any particular rivers or countries, etc., without possessing any clear notions of the charac-

teristics which make a thing a river rather than a pond, etc., or being able to pick out the objects when they see them. Now educated adults may be supposed to at least know enough to realize their ignorance and mend it. Any of my readers who had not enough experience of the words connotation and denotation would, I trust, have the wisdom to go to work and find out. But children may be as ignorant of their ignorance as of anything else. They cannot be held responsible for their own mental progress, and so it becomes our duty to assist them.

Again, knowledge of the exact meaning of even the commoner conjunctions, adverbs and pronouns is not a human birth-right, but is the result of experience of their exact use. Yet the appreciation of relationships depends as truly on the proper comprehension of these as of the names of objects and actions and qualities.

In general, the child has had an incomplete experience of words, as he has of objects or actions. Shades of meaning are not felt, and all distinctions are lost in a mental cloud. The dependence of young children on gestures is amazing to any one who has not observed that special point. Probably fifty per cent. of teachers would have difficulty in recognizing their ideas if they saw them in the shape in which their scholars get them. Yet education depends on what the children get, not what we give.

Again, it is often a fallacy of teaching to suppose that children know what they have been taught, that the graduate of the fifth-grade is equipped with abilities corresponding to the fifth-grade course of study, as printed in the superintendent's report and administered by the fifth-grade teacher. Let any teacher who believes it test her class.

Again, we have for so many years made the simple elementary movements without effort or attention that we tend to imagine that children move their eyes and fingers and

vocal apparatus at will, as we do, and that their failures are failures to try, that nervousness due to the effort involved is perversity, and that the remedy is rebuke or cajolery.

Throughout school-life children's lack of experience modifies their reactions. By extempore diagnosis or by systematic investigation or by both, the teacher may gain insight into the contents of her scholar's mind, so as to choose suitable means to produce the reaction she desires. We need actual determinations of what children of different ages, classes and degrees of training can comprehend. There is too much talk about suiting things to children's comprehension and too little effort to see just what does suit and why.

The student should go over some score or more of children's mistakes, and notice those which are evidently due to lack of proper mental content. He may well take any elementary text-book in grammar, history or geography and see whether, in the grade for which it is designed, the children have had sufficient experience of the objects and words involved to use it properly. He may also profitably examine the amount of knowledge that is carried over from year to year by repeating an examination in geography or history in the winter, spring and following fall. See Section 20.

9. ATTENTION

From what we know of attention, we may surmise that the changes that occur in the ways we attend from babyhood to manhood will follow two main lines. There will be:

1. A change in the sort of things that win our attention without effort on our part.

2. A change in our powers to stand the discomfort of the feeling of effort, to attend in spite of it.

It is as a fact obvious that every year, almost every day, the attraction which some things possess for us lessens while that of others increases. The father attends to the newspaper he is reading, regardless of the pony-cart standing outside; his little boy can hardly take his eyes off the pony-cart to look at the words his governess is trying to teach him. By mere growth attention moves, for instance, from the charms of running after butterflies and paddling in the water to those of stirring fights and races, and later still, to those of showing off before the gentler sex. By outer influences it is led from toys and tinsel to stories and games, to scientific research or the accumulation of a fortune. Chief amongst the outer influences are the power of pleasure to lead us to attend to whatever brings it, the subtler force of example, the limitations of our attention by our physical surroundings, and that influence of habit whereby what is often attended to with effort comes at last to win our attention of itself.

The *process* in the case of the changes in involuntary attention that are due to outside conditions is the same with children as with adults; the changes are so much more notable in the former because the conditions change so much faster. We may leave any minute account of it to general psychology. The process where they are due to inner growth is a case of

a number of delayed instincts, for when we say that by virtue of inner growth certain objects become attractive at certain times, we only say that we come to attend to them without outer influence, *i. e.*, without learning to. A perfect catalogue of instincts would then include an answer to the question of the development of involuntary attention from within.

Such a perfect catalogue it is almost hopeless to expect, for the outer influences on human beings are so multifarious and incessant that after earliest childhood they effectually hide native tendencies. Many attempts have been made to ascertain children's interests, which amount to the same thing as their tendencies to attend, at various ages and along various lines. No one of them has been sufficiently in advance of what we know by common observation to be of intrinsic value, or thoroughly enough done to be worth quoting as a sample of the way to study the question.

The following quotation from Professor James describes the facts of the change in involuntary attention so admirably that we are tempted to acquiesce in his explanation of them all as due to inner growth. But they clearly are not, as we shall see after considering his words.

"With the child, life is all play and fairy-tales, and learning the external properties of 'things;' with the youth, it is bodily exercises of a more systematic sort, novels of the real world, boon-fellowship and song, friendship and love, nature, travel and adventure, science and philosophy; with the man, ambition and policy, acquisitiveness, responsibility to others, and the selfish zest of the battle of life. In all pedagogy the great thing is to strike the iron while hot, and to seize the wave of the pupil's interest in each successive subject before its ebb has come, so that knowledge may be got and a habit of skill acquired—a headway of interest, in short, secured, on which afterward the individual may float. There is a happy moment for fixing skill in drawing, for making boys collectors in natural history, and presently dissectors and botanists; then for initiating them into the harmonies of mechanics and the wonders of physical and chemical law. Later, introspective psychology and the metaphysical and religious mysteries take their turn; and, last of all, the drama of human affairs and worldly wisdom in the widest sense of the term."

Now with the child, life is not all play, etc., if he be a slum-child who has to wash spittoons every morning and sell papers all the afternoon, and eat only when he earns. Such children gain the "acquisitiveness, responsibility to others and selfish zest of life." So the gilded youth whom fortune frees from the need of "getting on," and whom a certain social atmosphere frees from any pressure towards "ambition and policy," etc., may, until he is fifty, maintain unmodified his interest in bodily exercise, boon-fellowship, etc.

There may be happy moments for fixing skill in drawing, etc., but reasonably observant teachers have not noticed them to give them definite dates. And to just what extent all these interests develop from within in some regular order is still an open question. I should consider the outer influences more important.

Changes of whatever sort in our involuntary attention involve becoming inattentive as well as attentive. As new objects become attractive, so some objects lose their attractiveness. What once distracted us ceases to.

One of the most advantageous factors in the changes undergone by our involuntary attention is the mental law that what is done often enough voluntarily tends to become involuntary. Voluntary attention is, in a measure, its own reward, for it transforms itself to involuntary after a time. For a while we have to try to listen to our teachers and preachers, but at length we listen without effort, and may reach such a condition that we just have to listen to any one, no matter how profitless, who chances to lecture or preach or argue in our presence. This miracle of the transformation of distaste into zeal by mere repetition is a fortunate thing for us, but we should not rely too much upon it.

Besides learning to attend without effort to different orders of things, we learn to stand the strain of effort so as

to attend voluntarily where there is need. This is one of the great disciplinary lessons. We learn that, in certain cases, we can resist distractions, inhibit contrary impulses, and we form the habit of doing so at will, that is, when we think it advisable. It may be that mere progress toward maturity, or, to use our common expression, mere inner growth, provides an increase in this power to inhibit. It may be entirely due to experience. There are not enough data to settle the question.

Perhaps the most fundamental question in the progress of both involuntary and voluntary attention is that of the influence of any *special* acquisition on our *general* powers; of how far, for instance, learning to attend either voluntarily or involuntarily to books makes us attentive to natural phenomena; or how far attending to geographical facts makes us attentive to facts in history or chemistry or literature, etc. The facts form such a complicated tangle that no exact answer can as yet be given to the question. The gain in general attentiveness due to school training is probably much less than most teachers imagine.

A word may be added about methods of studying the changes in children's interests, that is, the direction taken by involuntary attention. Such work has been attempted along both general and special lines. For instance Mr. Earle Barnes had a certain story read to children, and then had them make drawings based on it. The features of the story that were set forth in the drawings were supposed to be those which most attracted the attention of the children. Mr. Clark Wissler tested the interests of children in the stories of their reading books by finding out which stories they remembered the next year. Mr. Taylor asked children directly which study they liked best.

Now anything that a child does is, of course, significant of his make-up, including his tendencies to attend. Be-

yond doubt children's drawings or replies or memories or what not, are connected with their interests to some extent; but the extent **may** be slight, and the connection very remote. Suppose that some one **should** read us a story, say, "Little Red Riding Hood," and you drew a wolf whilst I drew a cottage, and some one else drew the little girl. Would that show you that you were more interested in zoölogy, I in architecture, and the third person in child study? Obviously, the connection between our interests and the test is so remote and slight as to be practically nil. Now that may be the case with the studies mentioned.

Again, the interpretation of children's behavior is difficult. That a boy says he likes arithmetic best need not prove that his attention is really attracted by it more than by other subjects. He may say so for all sorts of other reasons. I might **have** drawn the house because I knew how to draw a passable house, but didn't know how to draw a wolf or a girl.

If we want to find out about the direction attention takes in any child or group of children, we have to make sure of some signs of the presence of attention, and then note the presence or absence of those signs. This is easy enough if one is face to face with the children day after day and observes them impartially. We can tell by their attitudes, by the absence of other activities, by their ability to answer questions, etc., whether a class is attentive and whether the attention is with or without effort in any special case. But if one wishes some objective test that he can apply to a thousand or more children, what must he do? He must make sure that the signs he chooses as indicative of attention are really so by testing them with people whose interests or lines of attention he knows perfectly. Suppose, for example, that Mr. Wissler had with thirty or forty children noted by careful observation which of the selections did at-

tract attention most successfully, and had then tested the thirty or forty in the manner described. If he found that the stories known to arouse the most interest were precisely the ones remembered, then he would be justified in using the superior memory of stories read as a test of interest in and attention to them.

For practical work, see Section 20.

10. IMAGERY

WE feel things in two ways. Sometimes our feelings are of things as actually present, at other times as not present. We may, of course, feel them as present **when** they really are not, as we do in our dreams. But with adults the feeling of a thing as there, is easily distinguished from the feeling of it as not there. Look at a book, then close your eyes and picture it. You could not mistake the two feelings.

With children this is not so clearly the case. Their imagery is not so clearly referred to unreal things, and their percepts or feelings of things as there, are not so clearly of real things. It seems likely that the brain-process going with percepts and the brain-process going with the corresponding mental images are in part identical, that the difference between them is in part a difference in the associated brain-processes. Take, for instance, the percept of a dog. The brain-process going with the sight of a dog becomes in one experience associated with the same brain-action continued, for if there is a real dog we keep on seeing it; it becomes associated, further, with brain-processes due to movements and sounds the dog makes, perhaps processes due to touching the dog, etc., etc. The brain-process going with the image of the dog called up from within is probably a weaker form of the same process *minus these associates*, for the imagined dog does not, of course, arouse them.

If we accept this theory of the difference between the brain-processes going with percepts and those going with mental images, we can see why children's images should be to them more realistic, and should even from time to time be confused with reality.

At all events, such a confusion, especially in memories of

them, does exist. The necessities of guiding our lives by realities rather than by our imaginations finally brings most of us to a clean-cut separation of our percepts from our images. We know well enough whether we really made a fortune last week or only fancied it in a day-dream. Only rarely do we show signs of what in earlier years was perhaps our normal condition. For instance, we apparently sometimes think things have happened which have happened only in our dreams.

But children of 3 to 6 years, and even of school age, live much in semi-dreams, in which the imaginations of play, the memories of the past and actual facts are often hopelessly confused. Such a confusion is one potent cause of a well-known class of children's lies. Says President Hall, in a long article entitled "Children's Lies:"

"One early manifestation of the shadowy falsity to fact of the idealizing temperament is often seen in children of three or four, who suddenly assert that they saw a pig with five ears, a dog as big as a horse, apples on a cherry tree, and other Munchausen wonders, which really seem at first but little more than that they have thought or have made that mental combination independently of experience. They come to love to tell semi-plausible stories, and perhaps when the astonishment is over to confess. Or again, all stories of men and things they hear are given a setting in the natural scenery, or far less often, in the houses they know best, and their friends are cast in the roles. The fancy of some children is almost visualization, and a few will tell at once, *e. g.*, what was the color of Barbara Frietchie's dress, whether she wore glasses and a cap, just where in their father's sheep-pasture the goblin in the Arabian Nights rose out of the bottle, if pictures of these objects have not obviated the normal action of this faculty. Revery which materializes all wishes, and the mytho-poetic faculty which still occasionally creates a genuine myth among children, boys who amuse their mates with long and often clever yarns of their own invention, girls who make up ridiculous things about others—to all these the school has paid little attention, and Mr. Gradgrind would war upon them all as inimical to scientific veracity. We might also say of children at least, somewhat as Froschamer argues of mental activity, and even of the universe itself, that all their life is imagination."—*Pedagogical Seminary*, vol. i, p. 215.

In his beautiful essay on *Children's Play*, Robert Louis

Stevenson describes some aspects of this failure of children to develop clear appreciation of real things as a class apart from their fancies. Of the influence of that failure on their truthfulness he says :

"One thing, at least, comes very clearly out of these considerations—that whatever we are to expect at the hands of children, it should not be any peddling exactitude about matters of fact. They walk in a vain show, and among mists and rainbows; they are passionate after dreams and unconcerned about realities; speech is a difficult art, not wholly learned; and there is nothing in their own tastes or purposes to teach them what we mean by abstract truthfulness. When a bad writer is inexact, even if he can look back on half a century of years, we charge him with incompetence and not with dishonesty. And why not extend the same allowance to imperfect speakers? Let a stockbroker be dead stupid about poetry, or a poet inexact in the details of business, and we excuse them heartily from blame. But show us a miserable, unbreeched, human entity, whose whole profession it is to take a tub for a fortified town and a shaving-brush for the deadly stiletto, and who passes three-fourths of his time in a dream and the rest in open self-deception, and we expect him to be as nice upon a matter of fact as a scientific expert bearing evidence. Upon my heart, I think it less than decent. You do not consider how little the child sees, or how swift he is to weave what he has seen into bewildering fiction; and that he cares no more for what you call truth, than you for a gingerbread dragoon.

"I am reminded, as I write, that the child is very inquiring as to the precise truth of stories. But, indeed, this is a very different matter, and one bound up with the subject of play, and the precise amount of playfulness, or playability to be looked for in the world. Many such burning questions must arise in the course of nursery education. Among the fauna of this plant, which already embraces the pretty soldier and the terrifying Irish beggarman, is, or is not, the child to expect a Bluebeard or a Cormoran? Is he, or is he not, to look out for magicians, kindly and potent? May he, or may he not, reasonably hope to be cast away upon a desert island, or turned to such diminutive proportions that he can live on equal terms with his lead soldiery, and go a cruise in his own toy schooner? Surely, all these are practical questions to a neophyte entering upon life with a view to play. Precision upon such a point, the child can understand. But if you merely ask him of his past behavior, as to who threw such a stone, for instance, or struck such and such a match; or whether he had looked into a parcel or gone by a forbidden path—why, he can see no moment in the inquiry, and it is ten to one he has already half forgotten and half bemused himself with subsequent imaginings."

We may now consider (1) the relative importance of

imagery in children and adults, (2) differences in type of imagery between children and adults, (3) types of children based on differences in imagination, and (4) the explanation of the so-called symbolism of children.

The healthy child likes to think, to have thoughts and feelings going on in his mind. Apart from any encouragement from his environment, he tends to keep up a constant supply, and images naturally occupy a principal place. With us this liking of mere thinking, regardless of quality, has turned into a liking for certain intrinsically desirable or practically useful sorts of thoughts, and the flood of miscellaneous imagery has therefore abated.

Like adults, children may have different types of imagination. They are likely to be better visualizers than they will be as adults. At least such seems to be the case with people who lead more or less intellectual lives.

If we take imagination in the common acceptation of the term as referring to the fact of inner repetition or manufacturing of experiences, we find that children seem to fall into two great groups. Some children seem to be decidedly matter of fact; a spade is to them a spade, a dish of pudding a dish of pudding. To others the spade is rarely a spade; it is rather a giant's spoon or a soldier's weapon; the pudding is a mountain or a fort or what not. To these latter the value of things is not what they are, but what they may be taken to be. To them life is largely what you can make believe comfortably. We may call them *inside* children as opposed to the *outside* children, whose interests are objective. It may be that the two classes are really simply the extreme cases of a single class, and that most children are about half and half. It hardly seems so, however, and at all events the distinction is practically a valuable one to note. The inside class seem brighter, are likely to attract a teacher's favor and interest, and are in general more sensitive. It seems

possible that great mental gifts go oftener with this type; that this imaginative zeal is a sign of general mental fertility. Hygienically, the other type may be better.

There is one other minor question, which will, however, take more of our space because it has wider practical bearing. Very much has been said about the so-called "symbolism" of young children. By symbolism we mean that a person uses some actual object as a representative of some other object or of some abstract quality, that he feels, "This is not the object or quality, but it means it, denotes it." Thus H_2O is a symbol of water; the lily may symbolize purity; the cross, Christianity, etc., etc. Now children are of course symbolizers in one sense in their play. When the child has a mock fight with a lot of sticks of wood, they may symbolize soldiers to him. When his imagination is following out a thrilling hunt, the cat may be taken for a tiger or the corner behind the sofa for a lion's cave. The child wishes certain desirable feelings of excitement, unimpeded progress of his train of imagery, etc., etc., and if he can be helped by using a cat rather than the word tiger to stand for the beast, he will. But he is really not so much a symbolizer as we adults. In words, in numbers, in schematic drawings, in formulæ, we symbolize constantly. We demand very little or no similarity between the symbol and the thing to which it refers, while the child demands much. We, therefore, can use more things as symbols. Try to get a child to let x stand for five soldiers and y for three Indians and z for eight horses! No, he wants sticks for the one, and sticks with feathers attached for the other, and blocks for the third! If we are to have a symbolic age in this sense, it should be that of the advanced mathematician or scientist. Children are far more truly named "realizers" than "symbolizers." They keep as near to the actual reality as they can.

At times the word symbolism has been used to denote, not this general function of standing for or representing something else, but the function of standing for *and producing the same feelings as* something else. "The cat," some would say, "is to the child playing hunt more than the word 'tiger,' because it arouses the same or more nearly the same feelings as the real tiger would. The cross is to us more than the word 'Christianity,' because it calls up in us more of the emotions of reverence, awe and sacrifice." If we take this meaning for the word we must still conclude that there is **no special reason** for calling early childhood the symbolic age. For of course the value of the cat as a symbol of a tiger is that it does *not* arouse the feelings a real tiger would. Little girls do not get from their dolls the feelings they get from real babies; for instance, they may like to take care of their dolls and object to minding the baby. Little boys do not get from companionship with spools and shells which they play are robbers, sailors, and brave heroes, the feelings they would get from companionship with real robbers or heroes.

The fact is that the imaginative play of children is a means to securing certain enjoyable æsthetic feelings without the painful accompaniments which the parallel real feelings would involve. You can have the fun of achievement in play without the work, the fun of battle without the hard knocks, the excitement of being chased by a bear tempered into delight by the surety that it isn't a bear. The imaginative play of children finds its adult compeer, not in the common use of signs for things, nor in the use of some signs to arouse the total mental state proper to the thing, but in our mental attitude toward the drama. The value to us of the scenery and actors of a play is that they call up certain feelings that we care to have, that they assist our imaginative play; and just that is the value of the toys and objects about which children make believe.

And what shall I say of those who, by a most extraordinary intellectual perversity, attribute to children the habit of using common things as symbols of abstractions which have never in any way entered their heads; who tell us that the girl likes to play with her doll because the play symbolizes to her motherhood, that the boy likes to be out of doors because the sunlight symbolizes to him cheerfulness? W. N. Hailmann¹ says of the wooden cylinder (Froebel's Second Gift): "On revolving the cylinder on an axis parallel to the circular faces, we find that it incloses a solid, opaque sphere; teaching us the lesson not only that each member of the second gift contains each and all of the others, but that whatever is in the universe is in every individual part of it; that even the meanest holds the elements of the noblest; that the highest life is even in what in short-sighted conceit we call death." Froebel said² of the sphere: "The spherical is the symbol of diversity in unity and of unity in diversity. . . . The spherical is the general and the particular, the universal and the individual, unity and individuality at the same time. It is infinite development and absolute limitation; it connects perfection and imperfection."

If we like to see Sherlock Holmes on the stage because he symbolizes to us craft, or Uncle Tom because he symbolizes to us slavery, or a clown from the circus because he symbolizes to us folly; if we eat apples because they symbolize to us the fall of man, or strawberries because they symbolize to us the scarlet woman, or if we live in houses because they symbolize protection, then perhaps the children play with a ball because it symbolizes "infinite development and absolute limitation."

No one has ever given a particle of valid evidence to show

¹ Quoted by Oppenheim, p. 99.

² Aphorisms, quoted in *Education of Man*, English Edition, p. 169.

any such preposterous associations in children's minds between plain things and these far-away abstractions. As I said, children for the most part have no such abstractions in their minds at all. Try to teach a six-year-old what time or space, or perfection or the goodness of God or unity is! Of symbolism in this sense of reading into objects high and vague and far-away abstractions, there is as little in children as there well could be. Possibly the German commentators on Shakspeare may have shown such a taint in their youth.

II. MEMORY

MEMORY involves the retention and the recall of ideas, and is dependent on the general method of functioning of a person's brain and on the number of connections he makes between the things to be remembered and other things. The permanence of any single idea will depend thus on (1) a person's general retentiveness, (2) the intensity of the original impression, which is largely due to attention, and (3) the number of associations made with it.

Because of this complexity of factors, it is hard to ascertain the differences in memory between children and adults or between children of different ages. In tests of memory, children do better year by year until about 15, but we do not know how far this improvement comes from a change in attention, and how far from improved methods of learning. It is a common belief that in mere general retentiveness children excel adults, and this belief is by no means disproved by the tests just mentioned, for the improvement in the two latter factors might more than counterbalance a weakening in general retentiveness, and leave the balances of improvement shown by the records of the tests. These we may now examine.

I shall now quote in order from "The Growth of Memory in School Children," by T. L. Bolton (*American Journal of Psychology*, Vol. IV, pp. 362-380), and "A Test of Memory in School Children," by John C. Shaw (*Pedagogical Seminary*, Vol. IV, pp. 61-78). Dr. Bolton tested children by reading them series of digits (*e. g.*, 52749381). "The digits were dictated slowly and distinctly at intervals of about two-fifths of a second, with care to avoid rhythm or grouping, and at a given signal, after the dictation of the number was fin-

ished, the children wrote the digits as they remembered them." Series of different lengths were used, viz., of five, six, seven and eight digits. The following table gives the percentages of *errors* made by pupils of different ages (Part I) and of different grades (Part II); that is, the first line of the table means that with a series of 5 digits the 8-year-old children make, on the average, 20 per cent. of mistakes, the 9-year-old children, 14.5 per cent., the 10-year-old, 12 per cent., etc., etc. In general, the steady improvement up through 14 years is obvious. Where the improvement is not steady, that is, where any age or grade is worse than the preceding, or better than the following grade, its score is in heavy-faced type.

| Number of Digits. | 8 yrs. | 9 yrs. | 10 yrs. | 11 yrs. | 12 yrs. | 13 yrs. | 14 yrs. | 15 yrs. |
|-------------------|--------|--------|---------|---------|---------|---------|---------|---------|
| 5 | 20. | 14.5 | 12. | 9.3 | 7.4 | 6.6 | 4.6 | |
| 6 | 56.3 | 45.5 | 42.5 | 32.4 | 31.3 | 27.7 | 23.5 | 25.3 |
| 7 | 78. | 64.6 | 66.2 | 62.5 | 51.5 | 49.2 | 36.1 | 40.7 |
| 8 | .... | .... | .... | 84. | 73.7 | 70.5 | 65.5 | 66.2 |

| Number of Digits. | 3d. | 4th. | 5th. | 6th. | 7th. | 8th. | 9th. | High School. |
|-------------------|------|------|------|------|------|------|------|--------------|
| 5 | 21.3 | 6.1 | 8.4 | 6.5 | 1.6 | | | |
| 6 | 63. | 39.9 | 43. | 32. | 16.7 | 16.6 | 16.5 | 9. |
| 7 | 87.7 | 63.3 | 67. | 59. | 46.4 | 44.5 | 32.5 | 50. |
| 8 | .... | .... | .... | 85. | 57.5 | 70. | 64.8 | 67. |

Mr. Shaw read to different school classes a story, containing 324 words, involving 152 distinct ideas.¹ The scholars

¹ The story was as follows:

"James Mack, ten years old, a farmer's son, dreamed that his father and mother died very poor, and left him nothing but 37 cents, a loaf of bread and a

were asked to write all they remembered of the story. The results for the 3d, 5th, 7th, and 9th grades and 2nd and 4th year High School pupils were as follows: The figures represent the percentages of terms remembered. Thus the 3d grade girls remembered 18%, whereas the 9th grade girls remembered 44%, or about two and a half times as much.

| | 3d. | 5th. | 7th. | 9th. | 2d High School. | 4th High School. | Univ. Stud. |
|------------|-----|------|------|------|--------------------|---------------------|----------------|
| Boys..... | 17 | 30 | 37 | 42 | 43 | 38 | 39.5 |
| Girls..... | 18 | 32 | 43 | 44 | 47 | 47 | |

Here again we see evidence of a continuous increase in the efficiency of memory up to a certain age, and then a fairly stationary condition.

It is hopeless to try on the basis of our present knowledge to separate the influence of attention from that of mere retentiveness in the case of these tests. Did the university students do worse than the 7th grade children in Mr. Shaw's test because their power of retentiveness was weaker, or

Bible. The day after the funeral, he had to take these, leave his home and his school, and go out alone into the wide world. It was Sunday, and a lame, crooked, little old woman, with a red shawl on her head, said: "Please give me your Bible." He did. Soon he met three boys who looked so hungrily at his bread, (so) that he gave it. Then came a ragged, black beggar with a stub pipe, one leg and a crutch, and into his hat James dropped all his money. To a blind schoolmate with no cap, James gave his. To an half naked, sickly fiddler boy with a lean monkey, he gave his coat and pants. At night, in a woods, he found a lost baby, naked, crying, and as it was dark, took off his last garment to wrap around it; made a big bed of oak leaves, crept in with his baby and hugged it to keep it warm. Then, as he lay looking up into the sky he said: 'Dear God, what can I do more?' It was just the perfect hush of midnight, save the hoot of an owl, and the distant bark of a dog. Just then the moon peeped out behind a pinkish cloud, and right under it appeared an angel child, which he thought was his dead sister Mabel's face smiling. There seemed a sweet perfume; a hand touched his head, and a gentle voice from the cloud said: 'This is the Christ-child.' James awoke. It was Christmas morning, and by his bed Santa Claus had put a silver dollar, a box of candy, a bottle of cologne, a music box, a loaf of frosted cake, a fur tippet and a gilt Bible full of colored pictures."

because the childish story had no zest or attractiveness to them? Did the high school boys in Dr. Bolton's test do worse with the 7 and 8 digit series because they had weaker powers of retention, or because they felt more self-conscious and so were distracted, or because they did not try so hard as the younger pupils? We cannot say. Dr. Bolton regarded his tests as primarily tests of concentration of attention, but as a matter of fact success in such tests does not go with general mental capacity, or with success in such tests as marking accurately the a's in a page or remembering the gist of a passage or remembering the length of a line, all supposedly dependent on concentration as much as his test was.

It is also impossible to say how far tests with different kinds of passages would show the same results as were gotten by the use of Mr. Shaw's story, or how far tests with letters or geometrical shapes or words or nonsense syllables or common objects would follow Dr. Bolton's. These tests, that is, may each have been of one special line of interest or of one special field of memory. It can be calculated that the progress from say 3d to 5th grade does not bear the same ratio to the progress from the 5th to the 7th grade in the case of Dr. Bolton's test that it does in Mr. Shaw's (about 71 % in Mr. Shaw's test as against about 61 % in the 7 digit test of Dr. Bolton's, or about 94 % in the case of the 6 digit tests). These tests then show within themselves evidence that they are not satisfactory tests of retentiveness or of attention, or of any general quality. However, they are the best data at hand and they are worthy records of facts about changes in mental capacity in children which we may properly know about, even if we cannot ascertain to just what factors the changes are due.

12. ASSOCIATION

PERHAPS the most important question which we can ask about our mental life is, "What determines the order of our thoughts?" "What decides what thing shall be thought of at any given time?"

The factors which cause any thing to be thought of at any time are, we learn from general psychology: first, sense-impressions; second, the antecedent thoughts; and thirdly, the accidental play of brain-processes. The way that sense-impressions are influential, we have noted under sensation, attention and apperception. We have now to consider the influence of the antecedent ideas, the laws which determine what any given thought will make us think of next, the associations between things thought of, by which the thought of one thing calls up the thought of another.¹

The association of ideas in children follows the same general laws that it does in adults. As with adults, we find our thoughts following each other either in a spontaneous, go-as-you-please, uncontrolled way or in a purposive, directed, controlled way. The difference between the two sorts is the same, and the general causes influencing each are the same. What, then, is to be said about the association of ideas in children other than what general psychology says about adults? First, about the spontaneous, uncontrolled flow of ideas.

The younger children are, the more this outweighs in amount the controlled sort. Just as the attention of young children wanders aimlessly from object to object, so their ideas tend to flow in an aimless, undirected stream. Con-

¹ See James, *Briefer Course*, Chapter XVI; *Talks to Teachers*, Chapter IX; Thorndike, *Human Nature Club*, Chapter VIII.

tool of the order of our ideas is not a part of our instinctive equipment, but comes only as experience teaches us its necessity. This lesson children are slow in learning.

In the second place, the younger a child is the less is his mind differentiated into a lot of separate systems or attitudes, and the less are the associates of any idea confined within a group of relevant ideas, ideas belonging to a single mental system. This helps to make the ideas of children seem more incoherent and irrelevant than even the most spontaneous waking trains of thought of adults.

If we divide associations into (1) those where nearly the whole of the first thing is operative in calling up the second, and (2) those where only a part of it is,¹ we shall find that the proportions of the two sorts are not the same in children as in adults. The first class play relatively a greater role the younger and more immature a person is. This is one cause of their inability to think out abstract matters, to be guided by the essential points in a theory or argument.

Turning to controlled or purposive thinking, we find, of course, that children are not so successful as adults. Their minds wander away from the proper topic altogether, or they make pointless comments or are vacant of ideas. Purposive thinking is largely the product of attention acting on a system of more or less relevant associations. That is, in purposive thinking ideas come up that belong in general to the frame of mind the subject is in, and he helps to determine their result by selecting from among them the ones he shall keep before him. Now we have just seen (1) that the younger children were, the less equipped they were with such systems of associations, and when studying attention we noted (2) that children's attention was fickle, passing quickly from one object to another, and that (3) it was only by experience that they learned to stand the strain of effort necessary to

¹See *Human Nature Club*, pp. 92-93, or James' *Briefer Course*, pp. 267-270.

the inhibition of impulses in voluntary attention. These three facts explain the weakness of children in purposive thinking. There is, we must constantly remember, no mysterious inability of human beings to think rationally or consecutively, an inability due merely to lack of years. The differences between children and adults, here as elsewhere, are due to comprehensible causes.

The degree to which any one has his associations grouped into useful systems, and the degree to which when thinking he criticises the ideas that come up, selecting only those which fit, are important measures of his intellectual efficiency. It is, therefore, unfortunate that we have no accurate estimates of progress along these lines in the case of growing children.

There is a strong tendency in every one when asked a question, or when facing some problem, or when put in any situation whatever that demands thought, to respond by the first idea that comes into his head, regardless of its fitness to the occasion. Thus if we ask any one very quickly "Who slew Cain?" the reply will generally be "Abel." Very few of us always keep a critical guard over our ideas to make sure of their correctness and appropriateness to the occasion. If you ask a hundred students in a psychology class, "What are the reasons for the difference in mental imagery between children and adults?" you will be almost sure to find a score of answers that represent the thoughts that come up in the student's mind on thinking "mental imagery of children," but which have nothing to do with the question asked. Such cases are due to failure to inhibit or criticise, and so reject certain ideas. The inhibition or rejection is often done automatically without consciousness on our part.

Now children manifest this failure to a much greater extent than do adults. Ask a child six years old "What are shoes?" and he may say, "I had my new shoes on yester-

day," or, "My papa brought me a pair of shoes Saturday," or, "I got my feet wet Friday," or what not. The following cases are from the answers of children to a series of such questions put to them by Miss O'Grady, of Teachers' College:

Second-grade.

A lunch is when you go (to) the wood(s).

A yacht is what are house is on.

A policeman is my father.

A passage is what you put them (things) in.

Milk is white. A hen is sometimes black.

A cloak is warm.

A quarter is not as big as a dollar.

A policeman is not good to us; if we are bad, he will put us in jail.

A barber is good to cut my hair.

A box is what I like.

Coffee is for old people to drink.

A field is some corn stocks (stalks).

Some children in the seventh grade were asked, "In which city would you most like to live, Boston or New Orleans?" (They lived in a Pennsylvania city.) Among the answers were these: "I would rather live in New Orleans, because it is the greatest Gulf port." "I would like to live in New Orleans, because it exports more cotton than any other city in the United States." "New Orleans, because the country is full of cotton-fields." Not only to questions, but in all cases where some idea is needed, children will think of whatever thing has gone with that situation or some part of it, regardless of its fitness in the present case. As was stated in a preceding paragraph, accurate estimates of this tendency would be very valuable information about any child or group of children.

13. REASONING

It is not possible to separate reasoning sharply from ordinary thinking. It is not even possible to use the word reasoning with any precision, for its common sense meanings are too many and its use in psychological books is not fortunate. It will therefore be best to state in every case explicitly what we are talking about.

The mental stuff involved in human thinking is not only percepts and images. We have also (1) feelings of the relationships of things gained by comparing things, such as of equal and unequal, like and unlike, greater and less, above and below, causing and caused by, whole and part, etc., etc. We have further (2) feelings of meaning, for instance, that we mean all men or some particular man or the average man or the qualities comprising manhood. We may mean, that is, all of a class of objects, or some individual thing, or some quality or qualities. The feelings are called respectively concepts or general notions, individual notions and abstractions. We have also (3) feelings of "isness," feelings that things are so are not so, which we call "judgments." It is these three sorts of mental stuff that play the great roles in rational thinking.

Now about these mental states in children we may say that by the school age, and in fact long before then, they are all present. The six-year-old has all the elementary feelings involved in reasoning. The change which occurs is not the appearance of these feelings, but their increase in number and in definiteness and a change in their manner of use.

The constant increase in general experience of things, and more particularly the increase in definite study of things due to educational influences, forces children to know more

relationships between things just as it does to know more things. More and more minute and more and more comprehensive relationships are grasped. We have thus all stages from the baby who feels that his father is not like his mother, that two pieces of candy are more than one, to the scientist who notes the similarity between man and the older monkeys or relates the phenomena of gravitation to the electrical charges of ions.

The exigencies of practical or school life teach children to acquire new meanings and to refine the old. The child entering school has no feeling of meaning such as we have when we think *39* or *0.014* or *volcano* or *Henry Clay* or *rodents*. His feelings of the meanings of man, animal, house and all the thousand symbols he does possess, are vague and incomplete. Only little by little, through constant correction and revision, do his concepts and abstractions come to be such as fit the usage of science or literature of educated people.

This refinement in feelings of meanings involves a refinement in judgments. Moreover, the habit of making judgments instead of simply having a succession of images grows with age and experience. Children to a large extent live a loose and hazy intellectual life; ideas come and go without being thought over or put into the form of statements. With education we come to live with a thousand questions on our mental lips and to turn all our experience into answers to these questions, into conscious judgments. The child walks down the street and drinks in the sensations he gets perhaps more fully than his father. He has perhaps an equal flow of imagery. But the father gets from the walk a number of definite judgments. He thinks "That house is new," "That horse is black," "I am tired," "This is a hot day," "That must be Jones' hired girl," etc.

Why, if all the elements involved in reasoning are present

after the first three or four years, do not young children reason as adults do? The answer is that they *do* reason in the same way, using the same general process. The following instances from an article by H. W. Brown in the *Pedagogical Seminary*, Vol. IV, pp. 358-396, show children making inductions and deductions after the same general fashion as adults:

111. (2 yrs.) T. pulled the hairs on father's wrist. Father: "Don't T., you hurt papa." T.: "It didn't hurt grandpa."

112. (2 yrs., 5 mos.) M. said: "Gracie can't walk; she wears little bits of shoes; if she had mine she could walk. When I get new ones, I'm going to give her these, so she can walk."

120. (2 yrs., 9 mos.) He usually has a nap in the forenoon, but Friday he did not seem sleepy, so his mother did not put him to bed. Before long he began to say, "Bolly's sleepy; mamma put him in the crib." This he said very pleasantly at first, but, as she paid no attention to him, he said, "Bolly cry. then mamma will." And he sat down on the floor and roared.

124. (3 yrs.) It was between five and six in the afternoon, the mother was getting the baby asleep. J. had no one to play with. He kept saying, "I wish R. would come home; mamma, put baby to bed, so R. will come home." I usually get home about six, and, as the baby is usually put to bed about half-past five, he associated the one with the other.

125. (3 yrs.) W. likes to play with oil paints. Two days ago my father told W. he must not touch the paints any more, for he was too small. This morning W. said: "When my papa is a very old man, and when I am a big man and don't need any papa, then I can paint; can't I, mamma?"

129. (3 yrs.) G.'s aunt gave him ten cents. G. went out, but soon came back, saying, "Mamma, we will be rich now." "Why so, G.?" "Because I planted my ten cents, and we will have lots of ten cents growing."

128. (3 yrs.) B. climbed up into a large express wagon and would not get out. I helped him out, and it was not a minute before he was back in the wagon. I said, "B. how are you going to get out of there now?" He replied, "I can stay here till it gets little, and then I can get out my own self."

134. (3 yrs.) F. is not allowed to go to the table to eat unless she has her face and hands washed and her hair combed. The other day she went to a lady visiting at her house, and said: "Please wash my face and hands and comb my hair; I am very hungry."

137. (3 yrs.) If C. is told not to touch a certain thing, that it will bite him, he always asks if it has a mouth. The other day he was examining a plant to see if it had a mouth. He was told not to break it, and he said, "Oh, it won't bite, because I can't find any mouth."

Very young children undoubtedly reason. They do not reason so well, first because they haven't the necessary data. The right ideas are not present, and so cannot operate. Wrong ideas come up and are accepted because the other ideas which would show them to be wrong are not present. Again, children have not learned to look for the essential part in any thing they are thinking about. They have not learned to break the total fact up into its parts and make use of the part that concerns their purpose. Nor have they had opportunities in most cases to learn what the essentials are. All things are to them much like what a game of chess is to the beginner. He cannot reason out the best move to make, because he does not see the essential element in the situation of the pieces, has not learned what the essential elements are in the various conditions of the game. He reacts to the whole thing roughly, or to some feature which for his purpose is unimportant, and so blunders. Thus, in the first case quoted, the child made his inference regardless of the fact of differences in people. In the second a non-essential was taken as the essential feature of being big enough to walk. In the third case, the reasoning was probably good. In the fourth case, a non-essential was connected with R's coming home. In the fifth case the reasoning was good. In the sixth case the data (of wagons growing small) were false, or rather the child lacked the datum that wagons do not grow small. In the seventh case the child lacked data concerning the difference between seeds and inorganic things. And so on through the list.

Again children, and in fact many adults, have not learned any systematic ways of keeping their conclusions valid. They have not noted the common general fallacies, they have not learned how to be sure of including all cases when they make some conclusion from a lot of particulars.

There is in children a strong tendency to argue from

analogy, to think that a thing which resembles something else in one particular will resemble it in others. Professor Jastrow says, on pp. 251 and 252 of "*Fact and Fable in Psychology*":

"That children are fond of reasoning by analogy there can be no doubt; their confusion of fact with fancy, their lack of extensive knowledge and the ability to refer effects to proper causes, their great love for sound effects and play of words, the earnestness of their play convictions—all these furnish a rich soil for the growth of such habits of thought as we are now considering. On the other hand, the influence of their adult companions, of their conventional surroundings, of the growth of the make-believe sentiment by which the laws of the real world are differentiated from those of fairy-land, make it difficult to pronounce as an argument by analogy what may really be a half-conscious play of fancy or jugglery of words and ideas. There is, further, considerable difficulty in collecting characteristic and unimpeachable illustrations of arguments by analogy in children, owing to the general lack of suitable collections of children's spontaneous and original mental reactions. What fond parents are apt to observe and newspaper paragraphers to record are sayings that amuse by a quaintness or the assumption of a worldly wisdom beyond their years, while the truly suggestive traits pass unrecorded for lack of psychologically informed observers. There is thus a gap to be supplied by valuable and suggestive study of analogy in childhood. However, not to pass by the topic without illustration, I may cite the reply of a little boy who, when asked his age, said he was nine when he stood on his feet, but six when he stood on his head, because an inverted 9 makes a 6; he was certainly reasoning by a far-fetched analogy, however little faith he may have had in the correctness of his reasoning. The children who believed that butter comes from butterflies, and grass from grasshoppers, beans from bees, and kittens from pussy-willows (Stanley Hall), may have been simply misled by sound-analogies; but when Sir John Lubbock tells us of a little girl saying to her brother, 'If you eat so much goose you will be quite silly,' and adds that, 'there are perhaps few children to whom the indication would not seem perfectly legitimate,' we appreciate that such arguments, so closely paralleling the superstition of savages, may be more real to children than we suspect."

In Mr. Brown's cases we find the following examples of analogical reasoning:

(5 or 6 yrs.) Whenever we had a thunder-storm I felt very much puzzled, and wondered what caused it. One day I went with my father into a mill, where I saw some machinery which made so much noise I could not hear anything that was said. After I went home I began to think about what I had seen, and finally came to the conclusion that up in the sky there must be a lot of machinery which

God would put in motion when He wanted it to thunder. I thought probably He had some way of making the machinery sound very loud and gradually let it become softer until we could not hear it, and then make it loud again. I felt very glad indeed to think that I had found out what made thunder. I did not tell anybody of what I had been thinking.

(5 yrs., 11 mos.) Child: "I know what makes the sky; it's the smoke." He had been riding in the cars, and noticed the smoke rising from engines.

Our previous study has fitted us to see why this tendency to draw conclusions from analogy exists so strongly in children. We saw that they tended in any situation requiring a thought to accept the associate which came up, regardless of its fitness. Now, it is one of the fundamental laws of association, that when one idea contains an element or elements common to another, it will tend to call that idea up. "Thunder storm making a loud noise" calls up "machinery making a loud noise," and the child accepts divine machinery as the cause of the thunder-storm. "Sky with cloudy look" calls up "smoke with cloudy look," and the smoke is taken to be the cause of the sky.

From these facts it is clear that, as regards the mechanics of the reasoning process, children differ from adults only as adults differ among themselves. Not some mysterious inner transformation, but the enlargement and refinement of experience, the formation of systems of suitable ideas, the knowledge of the aspects or elements of things essential to different purposes, the acquisition and habitual use of systematic methods of forming and testing conclusions, the growth of skepticism concerning the similarity of things alike in some respects, the definition of terms and the crystallization of experiences into judgments, are what make the rational man out of the blundering child.

What reasoning a person will actually accomplish depends on the presence not only of certain powers or functions, but also of certain interests or propensities. It there-

fore remains for us to discuss the changes that take place in the latter.

It has often been said that the years till 12 or thereabouts are the years for acquisition, of gaining acquaintance with things, and that only later comes the period of reasoning, of *thinking about* things. Our school practice has to a large extent been consistent with such a theory. Some thinkers have claimed that adolescence brought the interest in reasoning, particularly about abstract matters, and the power to reason well.

It may be that the rapid increase in general bodily and mental vigor which characterizes adolescence may cause increased zeal and success in reasoning, as it does in other mental functions. It may even be that the functions concerned in reasoning are especially strengthened at this age as a matter of mere growth. But there has been no rigorous proof or even satisfactory amount of evidence for this view. We should, therefore, be very careful not to let the possibility that the presence or absence of an interest in thinking out things is due to an inner growth beyond our control prevent us from paying attention to those causes of such an interest which are due to external influence, and so are subject to our guidance.

Some such causes are the following:

(1) Within the limits of our capacities we reason as much as it pays us to do. Where we can comfortably follow habit or example or rote memory, we do. Now children may, as is the case with some adults, have the capacity for reasoning, but be infrequent reasoners because it does not pay them to do so. For the purposes of their simple existence, obedience, imitation and receptivity may pay better than an aggressive interest. They do not have to think why their

parents take care of them, or why they go to school, or why it is good to be clean, or bad to tell lies, or what the similarities are between geography and nature study, or arithmetic and grammar. Nor does it sensibly profit them to. It is when we are left to ourselves without a guide in some novel situation that we have to think about matters or suffer. The objection may be made that we arrange the lives of children so that they don't in their earlier years need to think things out, because they are not fit to, either in capacity or zeal. This we saw in our study of the mechanics of reasoning in children to be partly true, but it is also partly false. Many people certainly retard the intellectual development of those in their charge by giving them too little opportunity for the profitable use of reasoning. And it is probable that the generality of us do so somewhat.

(2) As children reach the period of adolescence, certain feelings of aggressiveness, of self-consideration and of dislike to restraint come instinctively, especially in boys. These emotional states bring with them independence in thought and action. Moreover, their presence makes it easier to deal with children then, especially with boys, by giving them some freedom of action. Thus at adolescence there is increased need of reasoning, which, of course, meets with a response. Freedom in action tends to be followed by an increased interest in thinking things out. Girls, being brought up with relatively less of the former, show relatively less of the latter. Boys brought up under close watch like girls seem to show less than others. So also with classes. Institutional children, who have little chance for or profit from independent action, tend to take less interest in reasoning, we are told.

(3) When children have finished in school the acquisition of reading and writing, the tools with which they get knowledge, and have gained, in and out of school, experiences of the common facts of human existence, they have,

perhaps, more interesting matters to reason about than before and more interesting means to reason with. Especially if with adolescence the problems to be thought out come to be more and more those connected with personal choices, personal success and social relations, we might expect an increase of interest.

In so far forth, then, the zeal for reasoning would be subject to our control. By making happiness, esteem and the other factors of childish success depend more on their reasoning out their little problems for themselves and less on mere docility, we would create in children an interest in such thinking. By preparing them earlier for the freedom of action they will at adolescence demand, we would make boys attain more gradually the habits of independent thought which go with it. By encouraging independence in choice in girls, we would reduce the difference in zeal for reasoning between them and boys. By hastening the acquisition of the tools of the intellectual life, or giving side by side with them interesting data for thought, we would find younger children more zealous in reasoning than might now be thought possible.

As a matter of fact, educational practice and life in general seem to show that these changes can be wrought, and that consequently the causes mentioned as probable, are real.

The special questions concerning the growth of interest in and power to deal with abstract ideas, such as weight, color, virtue, bravery, triangularity, etc., etc., are somewhat subtle and involved, and we may best omit their discussion.

The power to reason *well*, we saw in our study of the mechanics of reasoning, to depend on the presence of certain data, general habits, and acquaintance with special logical devices to expedite, facilitate and safeguard our reasoning processes. It comes in proportion as these are acquired.

It is possible to take a totally different view from that so far discussed. One would have some justification who

should say: "Very young children not only possess the requisite elementary mental processes involved in reasoning, but also the interest in reasoning, but we nip it in the bud by neglecting their questions, making them accept mere words as explanations, by feeding to them the dry bones of mathematics and grammar, by teaching them to accept everything upon authority. It is not the case that the interest in reasoning comes late in youth; it comes early, but we restrain and dwarf it. Its apparent late appearance is due to the fact that the boys and girls who like to reason so well that they can succeed at even the dry and formal reasoning of mathematics and language, are the ones who continue in school through the high school period. Pupils of high school and college age seem to have made great strides in point of zeal and power, especially in abstract reasoning, but the appearance is due to the fact that they are the selected few of the great body of children, the few selected in part because they had these qualities beforehand in grammar or high school."

Such a claim deserves consideration. The last part of it may at least serve to remind us of one important fallacy possible in statements about children. The fallacy consists in taking a special class of children as truly representing all children of their age. If we examine the reasoning function in 100 grammar school boys, 100 high school boys and 100 college boys, and use the differences to represent the general progress of the reasoning function, we shall surely draw wrong conclusions; for the 100 college boys do not represent the same class of individuals as the 100 high school boys, nor the latter the same class of individuals as the 100 grammar school boys. This fallacy is common in all sorts of discussions of human nature.

The mistake is such as one would make who should compare 100 of the chickens in a large poultry yard on the 1st

B.T.F.

of August with 100 of those found there on the first of September, and again with 100 of those found there on the 1st of October, and because he found the percentage of roosters smaller each time, should conclude "that with age roosters turn into pullets." The percentage would be smaller, of course, because the poultry man killed roosters and saved pullets. Grammar school, high school, and college all eliminate certain sorts of minds, and we may be sure beforehand that what the average college students are, that the average of high school students never become; that what the average of high school students are, never represents the future of the average of grammar school boys and girls.

14. THE EMOTIONAL LIFE OF CHILDREN

THIS chapter might properly include several different sorts of facts. We might make a list of children's emotions and of the objects causing each; we might describe the relative prominence of each; we might study the various causes which decrease the amount of fear, rage, etc., and increase the amount of sympathy, envy, awe, etc. I shall, however, simply sum up very briefly some *general characteristics* of the emotional life of children.

Children under thirteen to fifteen lack, of course, certain emotions. This lack is practically important because it limits or changes the form of their appreciation of certain aspects of literature. Moreover, the inexperience due to their age and the conditions of their life deprives them more or less of direct knowledge of certain emotions, such as ambition, which influence the conduct of adult men and women, and so limits their comprehension of history and geography.

The common emotions (apart from those specially connected with adult life) are, however, more apparent and vivid in children than in adults. Fear, rage, timidity, joy and grief are among their most familiar and emphatic experiences. The inborn vigor of these emotions wears out with most of us, because conventional custom represses their expression, because we gain so many intellectual and practical interests, and because civilized life is from the point of view of our native emotional tendencies rather tame. Its situations do not arouse them to action. Washing, cooking, going to school and church, making shoes or overcoats or steel rails, buying and selling, eating regular meals and sleeping in fire-proof buildings with locked doors and watch-

men, are occupations not conducive to a vigorous emotional life.

What emotions children shall preserve or abandon depends as do all their habits upon the physical surroundings in which they are placed, the example of others, the way in which the world rewards or punishes the emotions' manifestation, and the ideas with which their minds are filled by what they see, read and hear. In general, in a civilized community, children thus change from beings whose emotions fit them for the existence of a social animal beset with dangers from animals other than his own kin to beings who can live, with emotional comfort and economy, the artificial life of the twentieth century. The positive side of this change equals the growth of interests and habits; the negative side equals the inhibition of instincts by disuse, suppression and transformation.

In the emotional life of children we see an evanescence and fickleness similar to that we noted in their attention. They turn from sorrow to joy, from anger to affection, as they turn their eyes from object to object. Their emotions are violent, but transitory, and one of the best practical ways of getting rid of undesirable emotions in them is the method of distraction.

There is one other fact of practical importance. With adolescence comes a great increase in emotional vigor and also instability due to the addition of the most important human emotions. The increase in vigor represents capital, which may be spent wisely or foolishly according to the guidance the youth has. The instability represents a disturbing factor in thought and conduct for which the teacher must make allowance. To these facts we shall recur when we come to a specific discussion of the facts and problems of adolescence.

15. THE ACTIVE SIDE OF CHILD-LIFE

WHAT I shall say about the movements or acts of children will not be an attempt at a general account of their abilities to make movements, to get such under control so as to make them at will, or of the way their actions are influenced by desires, choices, deliberations or effort. I shall instead pick out a few topics which seem particularly pertinent to the equipment of teachers, and of which our common knowledge and the general study of psychology are not likely to provide us with satisfactory accounts.

It may be worth while, however, to merely plan what a general description of the active side of child-life would be. We should have to know the muscular make-up of children, the changes in the ways of working of their muscles with increasing age, the changes in the ways of working of the nervous mechanism which causes these muscles to contract, the changes in the ideas, impulses and desires which appear to set this mechanism in action, the connections between such and different movements, and the changes in all the factors that control these ideas, impulses and desires.

What will actually be presented will be a description of the increase in motor ability, in the power to make movements, in physical skill, a few notes on habit, automatic action and inhibition, and a summary of the facts concerning suggestibility in children.

The question of the growth of motor ability in children is of broader reference than merely to the drawing, cutting, pasting, sewing and modeling in manual training courses. It bears equally upon early work in reading, enunciation and writing. Just as the fitness of topics and treatment in math-

ematics, history, geography and other sciences is conditioned by the mental capacities of children, so the fitness of all work involving movements is conditioned by the powers of motor coördination and control. The occupations of the kindergarten, the common practice of early instruction in reading from books and writing with pencil, have all been criticised as procedures that require of children precision that is beyond the proper scope of their immature nervous systems.

The problem is really a complex one, and is by no means yet settled. The first step, however, the determination of the changes in the motor abilities of young children with age, has been taken. Bryan's "Voluntary Motor Ability"¹ and Hancock's "Motor Ability"² are the most important contributions to knowledge on this matter. Such facts as they furnish must, when properly interpreted, be taken into account in any discussion of courses or methods that involve fine movements or a high degree of bodily control on the part of young children.

We must first recall a few simple anatomical facts and familiarize ourselves with one or two terms. All movements are due to the contraction (that is, the shortening and thickening), or the relaxation (that is, the lengthening) of muscles. In all the performances of which we shall treat, in all those acts which we ordinarily call acts, the muscles contract because of a stimulus given them by nerve-cells in the central nervous system (motor-cells). Motor ability, then, depends not only on muscles, but also on motor nerve-cells. Now the nerve-cells which conduct the stimuli to the muscles are themselves set in action by other nerve-cells, the action

¹ *American Journal of Psychology*, Vol. V, pp. 123-204.

² *Pedagogical Seminary*, Vol. III, pp. 9-23.

The essential parts of both articles are reprinted in the *Teachers College Record* for May, 1901. Parts of them should be read by the class.

W. H. L.

of which corresponds to our sensations, ideas, etc. So that our actions depend on (1) the connections of our brain-cells in general with the motor-cells, (2) on the proper functioning of the latter, and (3) on the proper functioning of the muscles. A person may fail to put a key in the key-hole (1) because he has never learned that it goes there, has never formed any connection between (*a*) the nerve-cells corresponding to the sight of the key and key-hole and (*b*) the motor-cells leading to the muscles that move his arm and fingers. He may fail also (2) because the motor-cells in question are absent, not fully developed, diseased or temporarily paralyzed. He may fail finally (3) because the muscles in question are absent or out of order.

When several muscles contract together at the same time or in series, so as to produce some definite movement, we call the fact coördinated action. When several movements together subserve some definite end, we call the fact coördinated movement. Coördination is evidently due to the connections of our brain cells in general with the motor cells. That person coördinates his movements in writing whose brain is possessed of connections between the cell processes going with hearing dog, cat, etc., and the motor-cell processes leading to the muscular contractions that make one write dog, cat, etc.

Such coördinations are of the highest importance. The acts thus brought to pass keep us alive and happy. Without them we should be mere hulks of flesh. They are also means to knowledge. They put us in situations where we get new information. They are also signs of the general condition of the brain.

In the number and delicacy and complexity of the coördinated movements that he can make, the infant differs from the baby, the baby from the child, the child from the adult. We have, therefore, to ask, What movements can children at

different stages of their development make? Various observers have added to and rendered more definite our knowledge that in the early years, the first sixteen surely, perhaps more, there is a progress toward a greater number and delicacy and complexity of coöordinations.

What, now, are the general causes at work in producing those changes? As usual, we have to choose among (1) inner development that comes as a consequence of growth, as a gift of nature, (2) learning or experience in making coöordinations, and (3) general changes in intelligence that make pupils understand better what they are asked to do, and try harder to do it. As elsewhere, the practical consequences of the acceptance of any one of these theories about the development of motor ability are tremendous.

It may be said at the start that all three factors are at work, and that the question is to assign the proper share to each.

We shall get along better if we restate the question by dividing the fact of coördination into two facts. Let us speak of the anatomical concord of movements and the psychological association of movements. By the anatomical concord of movements let us mean the contemporaneities and sequences of movements so far as determined by the structure of the nervous system due to its inner growth, and by the psychological association of movements let us mean those contemporaneities and sequences which are due to learning, practice. Instances of the former would be the simultaneous contractions and relaxations of the sets of muscles moving the two eyes by which infants at an early age move both eyes together in following an object, the simultaneous contractions of the muscles which hold the forefingers straight and extend the arm, the successive contractions by which the legs are moved in walking, or the vocal cords, mouth, etc., moved in crying or babbling "ma." Instances of the

latter would be the contractions causing us to hold the pen, and also move it in writing, to say, "Ma—ma—please—give," in order. The second sort evidently develops out of the first sort. Unless there were given structures in the nervous system causing such movements as produced the babble of infants, we could not, by learning to put different modifications of these movements together, have the psychological associations causing articulate speech. And until these concords are given the associations must wait.

If the concords for grasping appeared first in the tenth year instead of the first month, children could not form the psychological associations of using knife, fork and spoon until then. But once given certain elementary combinations of coördinations, and we go on smoothly to recombine them, to add to and subtract from them, and to connect them with others.

There is one further matter to make clear, if possible, though it does not admit of full comprehension by those unacquainted with the finer anatomy of the brain. Just as cell structures grow and develop connections which are manifested in the anatomical concords we have mentioned, so cell structures and connections may develop which are not openly manifested in any coördinated movements, but *which permit such movements in case circumstances coöperate*. For example, it would seem as if the movements of the vocal cords, etc., involved in the imitation by hunters of the calls of wild animals, were not necessarily openly manifested. Many people who could make them never do. Those who do make them, make them years perhaps after the possibility of making them was first present. We cannot be quite sure of this, but it seems likely that the inner growth of the nervous system brings about not only actual movements which we modify by learning, but also possibilities of movements which we may or may not realize. In the case

of these as well, provided they exist, we should have to wait until inner growth gave the possibility before we could have the actual performance.

The practical import is simple enough. (1) It is folly to try to teach children to make any coördinated movements for which the necessary anatomical concords, either openly manifest or not, are not yet developed. It is as foolish as to try to teach the six-year old to look over a fence six feet high. (2) It is conceivable that there is an optimum time to teach different classes of movements, a time when the anatomical concords on which they are based are readiest to be modified with least likelihood of injury to nervous health.

If we knew just the times when the different anatomical concords were developed, and on just which of them the different movements used in reading, writing, drawing, manual training, sewing, etc., depended, we could so plan our courses of study as to take the tide of nervous growth at its full. We could avoid premature efforts that would be bound to end in failure. We would save children from learning with difficulty and danger things they might, earlier or later, learn with ease and profit. We do not know the times when the different concords are developed, or even their order.

This ignorance results in all sorts of opinions and hypotheses. The immaturity of the nervous system is used by some as an argument against the introduction of reading or writing before the age of ten, against many of the kindergarten occupations, against all fine manual work in the three or four lowest grades. We find physicians protesting that the schools everywhere demand of the nervous mechanisms of children fine movements which they either cannot do at all, or can do only at the expense of health. We find in some cases these same physicians advocating fine finger movements as remedial treatment for children whose

nervous mechanisms don't work well. We find intelligent teachers who have watched the results of fine movements on the children who were forced to make them, unaware of any signs of evil results.

One notable theory of the order of development of these anatomical concords is that those concerned with the fundamental or trunk muscles come first, and those concerned with the muscles of the extremities later. Of these latter those concerned with the muscles nearest the trunk precede.

Most of the writers about coördinated action as a result of inner growth are very free with general statements and very chary of any definite dates, and still more so of any proof that their dates are correct. For instance, no one has proved that any of the nervous basis necessary for the associations involved in the reading, writing, drawing, cutting, pasting, measuring, modeling, sewing, etc., commonly taught in schools is delayed in appearance till after the fifth birthday. And it is hard to explain the infant prodigies who play the piano or violin at four or five, who learn to read Latin before they are seven, who do gymnastic and juggling feats, etc., if we agree that fine movements of the hands, eyes, etc., develop late. As to the general law that movements develop in the order of their grossness, the coarser ones first, it is completely false as a complete account. Darwin pointed out that one of the first coördinated movements to develop was one of the finest, namely, the curling of the toes and grasping by the fingers. These movements of the extremities come long before many movements of the trunk, shoulder and thighs.

There are certain lines of evidence in the articles quoted which emphasize the importance of inner growth as a cause of the improvement with age. Bryan found that in both rapidity and precision of movement the left side of the body improved as much as the right. Now this would seem

to show that training could have little to do with the improvement, since the right side would be trained in the movements tested much more than the left. Oddly enough, in the experiment on the ability to draw a straight line, the case where practice would seem to be of the most importance, the left hand improves more with age than the right. This equal progress of both sides is perhaps the strongest argument for belief in the growth of motor control as the result of general physical growth, and it should have much force. At the same time we must remember that any increase in general intelligence due to training would improve the records of left as well as right. Moreover, there is a tendency for any one making a simple movement with his right arm to contract the corresponding muscles in the left arm. We may thus get unconscious practice of the left arm.

There is also a set of facts among Bryan's results which, if we regard the progress of the left side of the body as evidence that training is an unimportant factor, supports the theory that the order of development of motor coördinations is from the trunk muscles toward those of the extremities. Bryan found that from 6 to 16 the finger improved most, the wrist next, the elbow next, and the shoulder least. The percentages of gain in rapidity for boys I calculate as:

| | | | |
|-------|---|----|----------|
| Right | F | 73 | per cent |
| | W | 56 | " " |
| | E | 48 | " " |
| | S | 45 | " " |
| Left | F | 77 | " " |
| | W | 67 | " " |
| | E | 50 | " " |
| | S | 46 | " " |

Excluding training as a factor, it would seem that the finer movements reached the same relative level of control later

than the large movements. However, we should note that there was no very obvious early "ripening" of the shoulder and elbow movements. They keep improving right up to 16 years, just as do the finger movements, though not so fast.

There are, finally, some facts in Bryan's study which may be taken as witnesses against the importance of inner growth as a factor. If the control of, say finger movements, comes with mere maturity, we should expect the increases in rapidity of tapping, accuracy of drawing a line and accuracy in the probing movement to follow the same general progress. They should have the same accelerations or retardations in rate, the same general character in all respects, for they would, by hypothesis, be due to the same causes. They do not. The peculiar pre-pubertal phenomena in the case of the rapidity of movement do not appear elsewhere. The extremely rapid rate of improvement from 6 to 8 years in the case of the straight-line movement does not appear elsewhere.

If we know little about the dates of appearance of the different nervous structures which make the psychological associations possible, we know still less about the degree to which they are perfect at the start, or the extent to which mere growth perfects them, or the way in which it does it.

The best practical attitude for the teacher of children 6 to 12 to take would seem to be to find out, by trying, the most economical time to teach the movements he wishes the children to know, and to make sure, again by trying, that they do not hurt the children's health. Whether they will or not cannot be told beforehand by any theory about the development of the brain by virtue of its inner growth, but only by observing directly the signs of brain-exhaustion.

What movements a child can profitably learn depends not only on what anatomical concords are present, but also on what psychological associations have been built up. If we

wish to teach a child to carve an Indian out of wood, we require not only that he shall have a nervous mechanism allowing him to grasp, hold, move his hands and fingers freely, but also that he shall have learned how to hold the knife, how to cut so as to take off a small or large piece at will, how to cut in an eighth or a quarter of an inch at will, etc. The influence of previous experience is as potent in the case of making movements as it is in the case of thinking thoughts. If a child of eight can learn to write more quickly than the child of five, it is in great part due to the fact that in the three years he has had experience of the finger and wrist movements involved, in his use of knife and fork and spoon and pencil and toys and so on. We can never estimate how much inner growth does for him until we learn how much experience does for him, and deduct that much from his total advance.

Increase in motor ability, we said, was also dependent on general changes in intelligence, that make pupils understand better what they are asked to do, try harder to do it, and we may add, know how to go about it. Just as an intelligent man will, other things being equal, make a more accurate drawing, a better dissection, a neater machine than a stupid man, so, even if inner growth and practice had no efficacy, the ten-year-old would do better than a five-year-old because he had gained a general fund of knowledge and sense.

HABIT.

The rationale of habit was given in the 'Human Nature Club,' in Chapters I, III and XII. A better account can be found in Chapter IV, Vol. I, of James' "*Principles of Psychology*."

In the case of young people, habits are more easily formed

than with adults, provided the habit be one independent of previous habits. Such are an accent, a gait, some unfamiliar movement in a game of skill. The general plasticity of the brain in youth is, of course, the cause. Where the habit is one such as hanging your coat on a certain nail, the adult might well form it more quickly than the ten-year-old street urchin, for he would have as a basis the general habit of hanging his hat somewhere, whereas the ten-year-old may never have had a hat to hang.

The growth of habits both limits and extends our mental equipment. It limits us, because every new habit formed tends to shut out certain possibilities. The boy who forms the habit of studying debar himself from the habit of laughing at zeal and faithfulness. It extends our mental equipment, because every habit, apart from its own intrinsic value, serves as a seed that produces other habits. Our boy will find his habit of study growing into the habit of reading, the habit of observing geographical facts, etc., etc. It is the teacher's business to see that the habits formed do not preclude other good habits, and that they do not, though good in themselves, foster other habits that are bad.

AUTOMATIC ACTION.

The development of mental life through childhood shows two tendencies; the one is to turn acts done at first without purpose or intent into purposive, voluntary acts, the other is for voluntary, purposive acts to become involuntary, automatic. For instance, walking is at first done involuntarily, without purpose or intent. Soon, however, the baby gets to feel that it wants a certain object, and to think of walking to get it. Later, perhaps, the sight of that object will automatically excite the act of walking. We have, then, in the period of development (1) a lot of actions done first quite

without foresight or intention becoming voluntary acts, getting to be done with prevision, and (2) a lot of acts changing from this latter condition to that of automatic performances.

The process by which (1) happens is not at all well made out. For the process in the case of (2) see James, "Principles of Psychology," Vol. I, Chapter IV.

INHIBITION.

Not only what we are, but what we prevent ourselves from being, determines character; not only what we do, but what we check or inhibit, determines our actions. The skill of the expert fencer consists in the elimination of useless movements, as well as in the execution of desirable ones. Inhibition of ideas is a main feature of attention, and inhibition of movement is a main feature of bodily control. As we should expect, it is comparatively lacking in children. Just as they let all sorts of imagery and spontaneous thoughts run through their heads without criticism, so they make all sorts of movements without inhibition. They get over doing so gradually, as they do in the former case. No sane teacher will expect perfect bodily control from a ten-year-old boy, any more than she will expect perfectly orderly, systematic, constantly critical thinking.

SUGGESTIBILITY.

We tend to believe in all the ideas presented to us, to act out all the orders given us, and only by criticism and inhibition do we restrain ourselves.¹ In children the criticising and inhibiting ideas are of course not present to the

¹See *Human Nature Club*, Chapter xiii.

extent that they are in adults, and consequently children are more suggestible. Very young children, however, are not so amenable to suggestion as those 8 or 9 years of age, for the very good reason that they are often unable or only partly able to get the idea or understand the command. For a suggestion to work to the best advantage the subject must comprehend the idea perfectly and still have absolutely no inhibiting ideas. So as children grow from a year or so to 16 or 18, they become better subjects by virtue of their increased comprehension, and worse subjects by virtue of the growth of a system of criticising ideas. Speaking roughly, we may say that up to 9 years the first tendency is the stronger, and after 9 years the second. Consequently, about 9 years is the most suggestible age.

In place of any more general statements, we may profitably examine the report of some experiments which show the suggestibility of children with some accuracy and on a fairly large scale. The complete account from which the quotation ("Pedagogical Seminary, vol. iv, pp. 176-220) is by Maurice H. Small.

A. EXPERIMENTAL WORK.

I. IN GROUPS.

The general *aim* of the experiments was to see how far illusions of sense could be produced by simple means in healthy children, grouped in their own school-rooms. No attempt was made to estimate the part played by imitation in producing the results; it is so closely related to suggestion that separation is not possible, yet care was taken to reduce the chance for it to a minimum. The work was done with nine grades, the last including the four classes of a high school. No pupil was passed over in any test excepting at his request.

I. Tests for Illusion of Perfume.

Means.—An atomizer with a Newman spray tube, some distilled water, and, incidentally, some very faintly perfumed cards, one of which was placed in the hands of the teacher, while another was given to some pupil who was asked to step to the desk and see whether the card was perfumed or not, but who was charged not to give judgment until asked.

Method.—After a moment of talk about matters of immediate interest to the grade in which the experiment was to be made, in order to gain the attention of all, the pupils were asked about some of the pleasures of last spring — walks in search of flowers, what flowers came first, where they were found, why boys and girls liked flowers, and how men preserved the fragrance of May-flowers, violets, apple blossoms and roses. Then they were asked whether they thought they could tell if the odor of any flower were in the room.

I next placed labeled perfume bottles on the teacher's table, and, taking the atomizer, told the pupils that I was about to make a spray in the room, as they might have seen friends at home spray plants; that if any one felt sure that he could smell perfume after the spraying, I wished him to raise a hand at once and hold it upraised until I could count hands in the room at the end of the trial, which lasted about a minute; but that I wished no hand raised, unless the pupil thought he got perfume.

A generous spray was then made in two or three places in the room. The teacher in each room assisted in the counting, until the pupils of the Fourth year were reached. From this grade the pupils *wrote* the name of the perfume which was suggested to them.

Results.—Grades I, II, III. The children of Grade I at first seemed to manifest an expression of wonderment in their faces, but like the other grades, they were eager and very attentive. When they saw the spray, smiles went over their faces, their hands went up, some declared that they could "smell it," that it was "nice" or "real strong," and some wanted "some on their handkerchiefs." When asked by their teachers if they were sure they were not mistaken, many declared themselves "sure." In two rooms of Grade II, I made a second spray immediately after the first had been recognized, and asked if the pupils noticed any change. Several at once answered: "It's a good deal stronger."

One reason for writing the name of the perfume in all trials after Grade III, was that the first teacher in charge of a room of pupils in Grade IV, said that her pupils would follow certain leaders if they had an opportunity. In Grades VI, VII, and VIII, there was a marked uncertainty of manner. The pupils hesitated more about writing than those in the grades before them. Certain movements seemed to indicate that it would be a help to them to know what their friends were writing. The 23 in Grade VIII (see table) who "thought," for an instant, that they "got the perfume," were not all sure. No one in this room wrote. Some of the number said that "for a moment during the spraying," they "thought they got the odor of Mayflowers, then of apple blossoms," but that "it went away and didn't come back."

The names written in the different rooms were in themselves a suggestion. Mayflowers, violets and apple blossoms were the favorites in the order named, but the one most frequently mentioned in the introductory talk always secured the most votes. About 8 per cent. of the names were scattering. Of these, "White Rose" and "Lily of the Valley" were the favorites. "Lavender," "Heliotrope," "Lilac Sweets," "Musk," and "Jockey Club" were named several

times each, while "H-o-a-r-t-s C-l-o-n-e" and "H-o-r-t-s C-o-l-o-n" appeared once each as a compliment to "Hoyt's Cologne."

It is interesting to note that three teachers, two of whom were in a side room during the experiment, got a faint suggestion of perfume.

The table which follows, shows the numerical result in 540 cases. The letters S, F, NS, O, and CG at the head of the columns, stand respectively for "strong," "faint," "not sure" (degree words used by the pupils), "no perfume," and "given card."

TABLE I.

| Grade. | Perfume. | | | | | | No Perfume. | | |
|----------|----------|-----------------|----|-----------------|-------|--------------------|-------------|-------------------|-------|
| | S. | Per cent. S. | F. | Per cent. F. | N. S. | Per cent. N. S. | O. | Per cent. O. | G. C. |
| I..... | 93 | 98 | — | — | — | — | 2 | 2 | 1 |
| II..... | 62 | 95 | — | — | — | — | 3 | 5 | 1 |
| III.... | 54 | 83 | — | — | — | — | 11 | 18 | 1 |
| IV. | 55 | 63 | 11 | 13 | — | — | 19 | 23 | 4 |
| V..... | 20 | 50 | 8 | 20 | — | — | 12 | 30 | 2 |
| VI. | 19 | 27 | 7 | 9 | 10 | 14 | 35 | 50 | 3 |
| VII..... | 4 | 13 | — | — | — | — | 27 | 87 | 1 |
| VIII.... | — | — | — | — | 23 | 67 | 11 | 33 | 2 |
| High.... | — | — | 25 | 47 | — | — | 28 | 53 | 4 |
| Total... | 308 | 51 | | 33 | | | 148 | | 19 |
| | | | | 392 | | | 148 | Av. p. c. Illus'n | 73 |

Similar tests were made, using distilled water after the suggestion that it was sweetened, a still object after the suggestion that it would move up. Tests were made upon individuals of the efficacy of suggestions that objects were hot, touched the child, etc. The test quoted is a fair sample.

In a test by another investigator a ball was tossed up three or four times and then a pretense was made of throwing it up. In the words of the author :

"After the performance each pupil was requested to write a description of what he saw and to state where the ball was when he ceased to see it. Two seventh grades, one fifth and one fourth grade were visited. Of the 165 children witnessing the experiment 78 answered to seeing the ball go up and disappear. Of the

whole number 103 were boys and 62 girls. 40 per cent. of the boys and 60 per cent. of the girls were deceived in the matter. A few typical answers are herewith presented:

1. I saw it come two times. It was about half way up to the ceiling before it disappeared.
2. I saw it come down, but not the last. It was about one foot.
3. I did not see the ball come down. It was half way to the ceiling before it disappeared.
4. I did not see the ball come down, but I think it did.
5. The ball didn't go up as far as the door before it disappeared.
6. I did not see the ball come down. The ball went about one-fourth to the ceiling before it disappeared.
7. It was about one yard from the ceiling before it disappeared.
8. The last time the ball was going to come down it disappeared.
9. The ball went in back of the picture on the wall.
10. I do not see what became of the ball. All I can think of is it went up into the air and did not come down, or at least, I did not see it."

(Norman Triplett, *The Psychology of Conjuring Deceptions*, Am. J. of Psy., Vol. ii, p. 493.)

M. Binet with the help of M. Henri and M. Vaschide made somewhat similar experiments on some school children in Paris. The children were shown a line 5 cm. long, which they drew from memory. They were then shown and made to draw one 4 cm. long, after being told by their master that they would see a second line longer than the first. Although it was one cm. shorter, many of them did draw it longer than the first.

Suggestion is often used in a very broad sense to cover the entire influence of example. In this sense, as in the more narrow sense that we have considered, it is more powerful with children than with adults. For as we grow older we become engaged in certain narrow lines of practical life, and have less time to drink in new ideas and live them out. We harden into "walking bundles of habits," and are less free to attend to the various acts of those about us or to imitate them. We learn to repel many ideas, decide that our dignity or the value of time or what not pre-

vents us from following our imitative impulses. Children, on the other hand, welcome all sorts of ideas, have fewer checks on their in-born tendency to act them out, and have more diffuse and general interests. So they become in play, soldiers, pirates, wolves or politicians, believe all sorts of fables, adopt all sorts of fads, tricks of manner, etc. The difference in suggestibility in both the narrow and the broader meaning of the word is thus not a wonderful elementary difference, but is the necessary consequence of added knowledge.

Suggestion then is an even more potent influence in childhood than in adult life. The common adages, "Example is stronger than precept," "Evil communications corrupt good manners," gain emphasis when applied to children. All their mental life is in part a product of suggestion. Their accent and gait, their taste in food or dress, their opinions and emotions, their interests and ideals are its plastic material. The arguments and precepts and lessons and rewards we consciously apply have as their constant help or hindrance the suggestions pouring in from books, teacher, playmates, home, in fact from everywhere.

Observation of and reflection on child-life with these facts in mind will enforce our conclusions and supply examples of them to any extent. I shall content myself with a striking case of the influence of suggestion on mental work, and a quotation concerning its importance in matters of moral education. The former is from Professor Jastrow's "Fact and Fable in Psychology," pp. 301-304; the latter is from Guyau's "Education and Heredity."

Professor Jastrow quotes from Mrs. May Cole Baker:

"The adoption of Mr. Hollerith's tabulating machine for counting the population of the country according, at one and the same time, to sex, color, age, marital condition, nationality, occupation or profession, language and school attend-

ance, presented an entirely novel problem to the office. The machines having never been used for any purpose, there was no previous experience by which to act or on which to predicate results. The necessity was upon the office of employing for a limited time (ninety days) at least five hundred people for this work alone, in addition to the one thousand who could be taken from other branches of the work and placed on this one. Every one, including Mr. Hollerith himself, felt that the rapid and accurate use of the punching machines called for a degree of cultivated intelligence not possessed by every clerk. So much for the mental attitude.

"The clerks (an instructor for every twenty) were taught to edit the family schedules from which the count was to be made, thus learning thoroughly how to read and classify the returns. In order to accommodate the returns to the capacity of a punching machine, a great variety of symbols were adopted for occupations and professions. Thus: Ad was for farmer; Ac, for farm-hands; Kd, for merchants; Gd, for agents, etc., through twenty-four two-columned octavo pages of ordinary type. Some one symbol must be used for each occupation recorded, and the use of symbols must be learned, and, for rapid work, they must be committed to memory. After five weeks of editing, one by one, the most reliable and intelligent workers were set to use the punching machines. The task is much like using a typewriter, substituting for keys a movable punch, which passes through lettered holes, and, in place of the forty keys of an ordinary typewriter, about two hundred and forty holes are to be learned.

"Mr. Hollerith set the number of cards for a day's work at 550 (each finished card contained, on the average, 10 holes). It was two weeks before that number of cards was reached by any clerk, and that only in exceptional cases. Then the entire force of the division was set to work. In two weeks most of them had reached five hundred, and the average was daily increasing. These clerks worked at first from edited schedules, that is, those on which had been written the symbols to be punched on the machine. A roll of honor was made out daily, showing the highest records, and in a week the clerks were doing from six hundred to fifteen hundred a day, but at a great cost of nervous force. So severe was the nervous strain that complaints were made to the Secretary of the Interior, who forbade any further posting of daily reports, and instead an order was posted that no clerk was required to do more than such a day's work as he or she could readily perform, and that no arbitrary number was required of any one.

"After the work was well under way, about two hundred new clerks were put into one room and scattered through the force already at work. They had no experience with schedules, knew nothing of the symbols, had never seen the machines. They saw those around them working easily and rapidly, and in three days several of them had done five hundred, in a week nearly every one, while the general average was rising. There was no longer any question of nervous strain, and one of these temporary clerks the day before she left beat the record by doing 2,230. I think the influence of mental attitude quite as remarkable in the matter of doing their work easily as in doing it rapidly. During the first

month many were actually sick from overwork when doing seven hundred, while after that time the idea that the work was unusually trying was never referred to. Another significant fact is that after the posting of the daily record was abolished there was no falling off in the daily average, as had been anticipated, while complaints of overwork necessarily ceased.

"It is thus demonstrated that an unskilled clerk, with the environment proving the possibility of a task and suggesting its easy accomplishment, can in three days succeed in doing what a skilled clerk, with a preliminary acquaintance of five weeks with the symbols to be used, could do only after two weeks' practice, and this because the latter, doubtless not a whit inferior in ability, had been led to regard his task as difficult."

Says Guyau: "Suggestion, as I have said before, is the introduction within us of a *practical belief* which is spontaneously realized; the moral act of suggestion may therefore be defined as *the art of modifying an individual by persuading him that he is or may be other than he is*. This art is one of the most important appliances in education. All education, indeed, should be directed to this end, to convince the child that he is *capable of good and incapable of evil*, in order to render him actually so; to persuade him that he has a strong will, in order to give him strength of will; to make him believe he is morally free and master of himself, in order that 'the idea of moral liberty' may tend to progressively realize itself. * * * *

"It is often enough to tell children and young people, or otherwise lead them to believe, that we assume this or that good quality in them, to induce them to exert themselves to justify the opinion. To assume in them depraved sentiments, to reproach them undeservedly, to treat them badly, is to produce the contrary result. It has been justly said that the art of managing the young consists before anything else in assuming them to be as good as they wish themselves to be. If an hypnotic subject is persuaded he is a pig, he straightway wallows and grunts like a pig. The same happens in the case of those who theoretically think themselves of no more worth than a pig; their practice must necessarily offer points of correspondence with their theory. This is an auto-suggestion. * * * *

"On the other hand, to believe in the wickedness of any one is as a rule to make him more wicked than he is. In education, therefore, we must always obey the rule just laid down: presuppose the existence of goodness and good will. Every statement made aloud upon the mental state of a child immediately plays the role of a suggestion: 'This child is naughty—he is idle—he will not do this or that.' How many vices are thus developed not by hereditary fatality, but by ill-advised education! For the same reason, when a child has misconducted itself, we must not in blaming it interpret the action in its worst sense. The child is in general too unconscious to have had a completely perverse intention; to ascribe to it deliberation, fixed purpose, and manly resolution in wrong-doing, is to deceive ourselves and develop those habits in it; to assume the existence of vice is often to produce it. We must, therefore, say to the child: 'You did not really wish to do that; but see how others would interpret your action if they did not know you.'

"When a man, followed by a vaguely threatening crowd, musters up courage to face it, and suddenly cries, 'You want to hang me, do you?' there is every chance that they will immediately apply the formula he has found for them. This is the case with a multitude of more or less bad instincts, which are necessarily awakened in the child's heart at certain moments of its existence; we must not give the child the *formula of its instincts*, or by so doing we strengthen them and urge them to pass into action. Sometimes, indeed, we create them. Hence this one important rule I lay down for educators: It is as useful to make good tendencies self-conscious, as it is dangerous to make the bad tendencies self-conscious, when as yet they are not so.

"A sentiment is a very complex thing—so complex that parents must not fancy they can raise it by a reproach. To assert, for instance, that a child is indifferent to its parents, is not the way to make it affectionate; on the contrary, it is much to be feared that assertion of indifference only produces it, or at any rate increases it, by persuading the child of its existence. A sentiment must be imputed in far more delicate terms than an act. We may reproach a child for having *done* or not done this or that; but in my opinion it should be a rule in education to *suggest rather than reproach in matters of sentiment*. * * * *

"The educator * * * should follow this rule: Persuade the child that he will be able to *understand* and to *do* a thing. In Pascal's words: 'Man is so made that by dint of frequent asserting that he is a fool, we make him believe it; and by dint of telling himself this, he makes himself believe it. For man carries on with himself an *inward conversation*, which it is of importance to regulate carefully; *corrumpunt mores bonos colloquia prava*.'

"We ought to accept what a child says or does out of good-will. His confidence in all those around him ought to stifle his innate timidity. When we think of the sum total of courage which a child, who feels himself such a mere beginner, and so unskillful in everything, must summon up to express himself or take the slightest initiative in the presence of adults, we understand how very important it is not to let timidity get the upper hand, and eventually paralyze him. We must, therefore, look at the child with an encouraging eye, making him observe, merely, in a quiet way, when the opportunity arises, that he would succeed better if he acted in such or such a manner. He must learn everything; we must show our appreciation of his least effort, while we tell him what effort has yet to be exerted." (Education and Heredity, *passatim*.)

16. MORAL EDUCATION AND DISCIPLINE.

THE moral life is distinguished from action in general by its relation to two things which we may call oughts and rights. When we think of an act as our duty, as an act that ought to be done, when we think of things as right or wrong, then, we say, we are dealing with a moral question.

The basis for moral conduct is partly inherited or born in us, and partly acquired by us. The inherited basis is our instincts, our general predisposition toward a higher or lower grade of intelligence, and the nature of what particular predispositions toward moral conduct there may be in us apart from experience. A boy born with the instinct of pugnacity in great intensity will be more likely to become a brawler than a boy born with the instinct of fear in great intensity. A woman born with the instincts of maternity predominant will be more likely to be benevolent to children than one in whom such instincts are weak. The child who lacks general mental vigor and adaptability will be less likely than his opposite to respond to the claims and profits of civilization and the enlightenment of the community, will be more likely to be a law-breaker. There may be, too, apart from evident instincts, particular types of mind, particular combinations of qualities which we have at birth which may push us toward virtue or vice.

At any rate, it is clear that all men are not born moral equals. We cannot expect the same conduct from all, or wisely provide the same moral education for all.

These innate differences are accentuated and modified by the acquisitions due to experience. Merely physiological changes may turn men from virtue. It is proverbial that bad temper in children or adults may be due to indigestion, as

well as to perversity of inclination. A cold in the head may make the most good-natured man sullen or peevish. The ideas that children acquire are another potent influence. As a man thinketh in his heart so he is to a very considerable extent, for ideas are springs of action. Ignorance of some things is a means to innocence, though not so sure a protection as knowledge plus the fixed habit of non-indulgence. The mere presence of ideas of honor, truth, courtesy and affection is a preparation for moral welfare, though contrary habits may annul their influence. The great bulk of moral acquisitions, however, are in the form of *associations of acts with impulses, ideas or other acts*, or *habits* as we may call them for short. People may have good ideas without having associated with them good acts; they may have bad ideas but associated with good acts. So long as the child is generous and just it makes not much odds whether he thinks of the nobility of justice or the personal advantage of greed. It does, as we have just seen, make some difference. It is of small moral profit for the little girl to think of playing with her baby sister, so long as she associates with that thought the act of refusing to do so. Tendencies to act in moral ways in the various moral situations of life are the final test of morality. And these tendencies are due to our habits, our ways of meeting such situations previously. They also depend on the general factor that controls our mental attitudes, namely attention. Just as the course of our thoughts depends upon the choices and inhibitions of attention, so also does the course of our conduct.

Let us now ask about the agencies which operate to cause these acquisitions. Let us turn over to physiology and medical science the question of the influence of bodily conditions on moral conduct. Teachers cannot be expected as a general thing to know when moral perversity is due to such, though it would be desirable if they did. The other agencies

education has to consider are (1) physical things, especially such as are the works of men, and (2) the conduct of human beings. The mere presence of filth, shoddy manufactures, adulterated foods, carelessly kept buildings, etc., acts as a stimulus to uncleanness, dishonesty and laziness in unformed minds. In pictures, books and newspapers we have of course the most potent moral agencies amongst things. In our conduct we are still more potently the creators of the moral natures of children. The force of imitation and of suggestion creates our likenesses in others; the incentives and deterrents of all sorts, from gross bodily pleasure and pain to the more intellectual forms of approval or disapproval, are constantly causing moral and immoral acquisitions; the precepts we teach have a further but slighter influence.

The problem of moral education is thus to take children of varied instinctive tendencies toward different sorts of moral action and with varied powers of appreciating the claims of the morally advanced people; to develop in each of them as far as may be a healthy physique, noble, worthy ideals and habits of acting rightly in the various situations of life, and the power of control by which good tendencies may be reinforced at will, the voice of good will and reason armed with the authority of preëminence in all conflicts. All this we do through providing so far as may be, suitable physical surroundings, including literature, etc., suitable examples, suitable incentives and deterrents and suitable precepts, and by giving our examples and precepts suggestive force. The greatest step is to secure in children esteem for the opinion of the best people. We all tend to be within limits as good as those we look up to expect us to be—not very much worse, rarely any better. Child study shows no royal road to correct moral judgments in children save through the slow path of rational acceptance of wise examples; nor to right moral actions save through the long acquisition of right

habits. They must build the ladder by which they climb. Child study has attempted to add to common sense more accurate knowledge of the instinctive equipment on which morality is built, and of the way particular concrete agencies act to uplift or debase.

From among such studies of the factors of the moral life in children we may take a few samples. Several workers have independently found evidence of the presence in children in an exaggerated form of the tendency to look on the letter rather than the spirit of any law or rule or command, to regard punishments not as remedial or preventive agencies, but as natural results of certain acts, regardless of intentions. This attitude comes out clearly in the following characteristic account of boy justice, taken from Mr. John Johnson, Jr.'s excellent study, *Rudimentary Society Among Boys*.¹ Mr. Johnson studied the social habits of the boys living together in an institution possessed of eight hundred acres of land quite isolated from outside influences. The study, as a whole, is well worth reading.

Disputes arising from their peculiar customs of ownership are settled by boys assembled at the place where the controversy is carried on. Most commonly this is in the play-room, where they can be free from observation. When Black and Landreth found the nest of a dove in the pines, seeing no mark of prior owners upon the tree, they took the eggs and brought them to the house. As they sat in the play-room, with needles and straws, preparing the eggs for their cabinet, Delphey overheard their talk, and questioned them about the spot where the nest was discovered. He soon convinced himself that the nest was one that he had found but a few days before, and on which he had placed the mark of himself and his partners. When he was satisfied on that point, he at once laid claim to the eggs. Landreth and Black angrily refused to give them up, and they were soon hot in dispute. Under the law made for such cases, the question of ownership is a nice one. It is granted on both sides that if Delphey, the first finder, is to retain a good title, his label must either remain upon the trunk of the tree, or else lie in sight upon the ground beneath, where it has fallen by accident. If neither alternative is complied with, any subsequent finder may either take the nest or mark the tree with his own label.

¹ Johns Hopkins Press.

By this time a knot of a dozen boys, who had been idling about, had formed around Delphey, listening intently. In a few moments he called Duvall, his partner, for confirmation, and with the utmost particularity related the circumstances in which he had found the nest. Delphey told of the route they took over the stream, through the swamp, and up the hill, and mentioned the boys they met on the way, whom he compelled to corroborate his assertions. By the time Duvall takes up the account, the ring surrounding them has become larger; perhaps twenty boys have gathered, and they listen with strained attention. He proceeds to describe the tree in which the nest was placed, and dwells with convincing minuteness upon its exact situation, upon the color of the bark, the broken limb, the knot half-way up the trunk, and the nailing of the label upon it. To all of his statements it may be that his adversaries, Landreth and Black, assent, only interjecting at intervals the words: "But there wasn't any mark on the tree when we were there." The declarations of either party are addressed as much to the throng around as to their opponents, and it is evident, in the heightened color of the bystanders, in their sparkling eyes, and in their tense muscles, that to them the question is of absorbing interest. Now that the argument of the plaintiffs has been heard in full, there can be no doubt that they marked the nest as they declare; and yet there is nothing to indicate that the defendants have any intention of restoring the property.

Seeing the angry looks and threatening gestures of all the group, one who does not know the school may judge that blows will follow next, and that a general conflict is about to ensue between the partisans of the claimants. Nothing could be farther from the truth. What has occurred is but the ordinary proceeding of a very primitive court of justice. Delphey knows that Black's arms are strong, his fists hard, and his blows rapid. Landreth has no desire to risk the destruction of his treasure in a struggle where, even if he retains it, he is sure to do so at the cost of bruises and blood. As he rises angrily from his seat and pushes through the crowd, he is not seeking space in which to fight, but a witness to establish his title. This body of spectators, who seem intent upon hearing the whole matter and sifting it to the bottom, is—if the name will serve—the folk-moot, the assembly of the people, met to see justice done according to law. Each boy standing in the ring around the orators knows that to-morrow he may be there to maintain his rights before a similar body, in which the plaintiff and the defendant of to-day will alike have a voice to decide upon his claims. He has a feeling that a decision contrary to established custom, however it may accord with his momentary sympathies, will be treated as a precedent to overthrow his most cherished interests and to prevent the operation of rules upon which he had confidently counted in every venture in which he is engaged. Every boy there is determined upon the entire preservation of the system of law upon which he has based all his hopes of filling his egg-cabinet.

We have turned aside a moment from following the actions of the litigants. The clamor of voices rose louder as Landreth moved off, but it subsided somewhat as he reappeared, accompanied by Miller, on whose testimony he relied.

The newcomer rapidly explained to those around that he, too, had seen the nest on the day Landreth took it; he had examined the tree, and Delphey's mark was not upon it; he had searched the ground beneath, and could not find the label there; he would himself have carried off the find but for the fact that he saw only a single egg, and thought it better to put his own claim-mark upon the trunk and wait till more eggs were laid, when he intended to return and get them. It had happened, however, that during his previous search for nests he had, in marking other discoveries, used up all the labels that he had brought with him, and he had, therefore, been unable to appropriate the tree at the time. It was after he had gone away, and before he could return with a label, that Landreth had found the nest and possessed himself of its contents, which had, meanwhile, been increased to two eggs by the industrious bird.

This evidence ended the trial. Loud cries arose from all parts of the throng. "It's Doggie's nest. It wasn't marked when he found it," said one member of the tumultuous court. "Your mark was blown away, Rufie," exclaimed another; "it's Doggie's nest." No opposition of importance was made, and, the decision being rendered, Delphey and his partner saw their case was lost, and slowly walked away. Landreth and Black, who retained the eggs, returned to their work of blowing them with straws. The making of the claim, the trial and the decision, occupied less than half an hour. If not sure, this justice is at least swift.

A word may here be given to the ethical questions brought up by this decision. It was admitted by all parties that the two boys had found the nest before Landreth and Black had seen it. Landreth's claims, in the view of equity, would have to yield to Delphey's, who not only found the nest, but marked it, and who, in so far as prior discovery gives any rights, clearly had them all. Landreth's title rested upon a purely technical ground. Yet, with a characteristic analogy to primitive habits of thought, it was considered that the perfect title was obtained by a literal fulfillment of the words of the law, by an exact compliance with its minutest provisions. The law provided that no one should take a nest when the mark was on the trunk beneath or in sight upon the ground. As it had been proved by Miller's testimony that Landreth could not have seen Delphey's label, Delphey's rights vanished.

There can be little doubt that the negligent driving of a tack was all that made Landreth the better owner than Delphey, and that Landreth was perfectly aware of this fact. When the suitors and judges were questioned as to why such a decision was given, the only reply to be obtained was, "That's the rule." Like Shylock, Landreth might have said: "I stand here for law," and his determination was to maintain to the full every legal privilege. The idea that the law might give advantages the use of which morality could not sanction is so late a development in the history of mankind that we must not regard the absence of such a conception among these boys as an indicative of an abnormally low state of moral culture: to look for exalted views of right and wrong among them would be to expect them to reverse the usual processes of mental progress.

John Johnson, Jr., *Rudimentary Society Among Boys*, pp. 36-40.

With this sample of boy justice we may compare one of the results of a study by Miss Margaret E. Schallenberger, reported in full on pages 87-96 of the *Pedagogical Seminary*, Vol. III, entitled "A Study of Children's Rights, as Seen by Themselves." About 3000 children wrote a language lesson after being read the following statement and question:

"Jennie had a beautiful new box of paints, and in the afternoon, while her mother was gone, she painted all the chairs in the parlor, so as to make them look nice for her mother. When her mother came home, Jennie ran to meet her, and said, 'Oh, mamma, come and see how pretty I have made the parlor;' but her mamma took her paints away and sent her to bed. If you had been her mother, what would you have done or said to Jennie?"

Their answers were classified under the following heads:

- | | | |
|-----------------------|------------------|---------------------------|
| 1. Ignorant. | 6. Scolded. | 11. Sent to bed. |
| 2. Explained to. | 7. Clean chairs. | 12. Whipped. |
| 3. Don't do it again. | 8. Confined. | 13. Punished. |
| 4. Made to promise. | 9. Lose meal. | 14. Peculiar punishments. |
| 5. Threatened. | 10. Lose paints. | |

Replies 1, 2, 3 and 4 testify roughly to a sense of equity, of consciousness of intention as the criterion of good or bad, while 8, 9, 10, 11, 12, 13 and 14 show, again roughly, the tendency to regard punishment as retaliation or as a fate overtaking certain acts, regardless of the intention that produced them. As children grow older the first sort of replies increase, while the second sort decrease. From the detailed table given by Miss Schallenberger I reckon the percentages for the different ages to be as follows:

| YEARS, | | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 |
|--------|---------------------|------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| Boys | Retaliation or Fate | 87.5 | 80.9 | 80. | 84. | 77. | 75. | 73. | 67. | 49. | 49. | 33. |
| | Equity | 8. | 9. | 7. | 9. | 12. | 9. | 14. | 16. | 32. | 36. | 59. |
| Girls | Retaliation or Fate | 92.5 | 82.5 | 81. | 70. | 67. | 64. | 60. | 55. | 49. | 37. | 36. |
| | Equity | 3. | 9. | 9. | 10. | 17. | 21. | 24. | 33. | 36. | 48. | 49. |

The following quotation from Miss Schallenberger states the general fact shown by the figures:

Almost as striking as children's reasons for punishment are their attitudes regarding the motive that lies back of the action. The intellectual and moral condition of a man can be fairly estimated by his ability and willingness to judge of the motives which actuate those about him. A marked difference in children regarding motives is noticeable.

The young child thinks of the result of an action. If the result is bad, punishment should follow; if not, the offender should be allowed to go free. A ten-year-old boy writes: "If the girl made the chairs nicer than they were, I would tell her that she was a good girl; and if she soiled the chairs, I would give her a whipping." A little girl voices the opinion of many another when she says: "If I were her mother, I would have whipped her for spoiling the parlor chairs."

Another one, nine years old, seems to us wise elders inconsistent when she writes: "Jennie thought that she was making the chairs pretty. But she spoilt the chairs. I would have taken her and I would whipped her and sent her to bed for the rest of the day. I would told her that she was a bad little girl."

Equally regardless of good intention is the statement of the child who says: "I would whip her and send her to bed without any supper;" and then adds, as if it were of no importance, "Jennie thought it would make her mother glad."

The older children, on the contrary, think of the motive that led to the action. If this be good, punishment should be light or not at all. Sometimes, because of this feeling, they grow indignant over the treatment of Jennie by the mother in the story.

It is facts like these which are at the basis of the common opinion of experienced teachers that when dealing with young children you should never make exceptions in discipline and never reverse a decision.

Akin to this is the psychological basis for the expedients which children devise or adopt to justify themselves in some action they feel to be wrong. They make lies innocent by adding some phrase which makes the lies formally a truth. Says Pres. Hall:

"Finally, children have many palliatives for lies that wound the conscience. If one says "really" or "truly," especially, if repeated, and most solemnly of all, "I wish to drop down dead this minute, if it is not so," the validity of any statement is greatly reduplicated. Only a child who is very hardened in falsehood, very fearful of consequences, or else truthful, will reiterate "it is so anyway," even to tears in the face of evidence he cannot rebut, while others will confess or simulate a false confession as the easiest issue. Only young children who mistake for truth whatever pleases their elders, or occasionally those too

much commended for so doing,¹ find pleasure in confessing what they never did. To say 'yes,' and add in whisper, 'in my mind,' meant no, among the children of several schools, at least in one large city. To put the left hand on the right shoulder also has power, many think, to reverse a lie, and even an oath may be neutralized or taken in an opposite sense by raising the left instead of the right hand. To think 'I do not mean it,' or to mean it in a different sense, sometimes excruciatingly different from what is currently understood was a form of mental reservation repeatedly found. If one *tries* not to hear when called, he may say he did not hear with less guilt. An acted lie is far less frequently felt than a spoken one, so to nod is less sinful than to say 'yes'; to point the wrong way when asked where some one is gone is less guilty than to *say* wrongly. Pantomimed lies are, in short for the most part, easily gotten away with. It is very common for children to deny in the strongest and most solemn way wrongs they are accused of, and when at length, evidence is overwhelming, to explain or to think, 'My hand or foot did it, not I.' This distinction is not unnatural in children whose teachers or parents so often snap or whip the particular member which has committed the offence. In short, hardly any of the sinuosities lately asserted, whether rightly or wrongly, of the earlier Jesuit confessionals, and all the elaborated pharmacopoeia of placebos they are said to have used to ease consciences outraged by falsehood, seem reproduced in the spontaneous endeavors of children to mitigate the poignancy of this sense of guilt." (Pedagogical Seminary, vol. i, p. 216-217).

Another common-sense opinion that investigation has supported is that children cannot profitably lead a mere placid intellectual life. They must have emotional and physical activity of some sort, or they will become sneaky, pusillanimous and full of petty vices, and, if they do not have healthy emotional excitement, they will find unhealthy excitement in illicit ways. Athletic games and social clubs are efficient agents in moral education, and for girls as well as for boys.

¹ Text has *and* inserted.

17. GENERAL MENTAL DEVELOPMENT

It is natural to suppose that if we knew how the human mind did actually develop from birth to manhood we should be able to see how to direct its growth in the lines which we esteemed. And in many places we have tried to show some of the concrete ways in which mental growth takes place. The most valuable insights for the teacher will, for the present, be gained from such concrete particular studies. But statements about mental development in general are being made all the time in school journals and books about children. *General* theories about mental development as a whole are consciously or unconsciously made the basis of educational theories. *General* statements, if true, would be the most important. So it becomes our business to seek an answer to the question, "How does the mind grow? What are the laws its development follows?"

It may be that there can be no one or two simple statements containing the answer to this question. It may be that mental growth is a complex affair, involving all sorts of factors and so entailing a long and elaborate answer. Again, it may be that we do not at present know enough about the facts to justify any attempt at a general theory. The best way to find out what is profitable for us to know is to examine critically samples of the theories in vogue, and then see if from our knowledge of the facts and any suggestions gained from them we can construct an improved theory.

We may conveniently group theories according to the nature of their answers to two sets of questions:

1. Is the mind's growth pre-determined, or is it a result of causes acting on it after birth? Is mental development as a whole due to inner growth or outside influences? Does

the mind create its own future, or is it the recipient of the effects of other agencies? Does it make itself, or is it made?

2. *a.* If the mind's development is due to inner growth, what law does that growth follow?

b. If the mind's development is due to outside influences, how do they work to produce the result?

We may first examine the following quotations from Frœbel. If they do not represent quite accurately the sum total of his theoretical view, they may still serve as an illustration of a possible attitude, and one taken frequently enough.

"Therefore, education in instruction and training, originally and in its first principles, should necessarily be passive, following (only guarding and protecting), not prescriptive, categorical, interfering.

"Indeed, in its very essence, education should have these characteristics; for the undisturbed operation of the Divine unity is necessarily good—cannot be otherwise than good. This necessity implies that the young human being, as it were, still in process of creation, would seek, although still unconsciously, as a product of nature, yet decidedly and surely, that which is in itself best; and, moreover, in a form wholly adapted to his condition, as well as to his disposition, his powers and means. Thus the duckling hastens to the pond and into the water, while the young chicken scratches the ground, and the young swallow catches its food upon the wing, and scarcely ever touches the ground, * * * *

"We grant space and time to young plants and animals, because we know that, in accordance with the laws that live in them, they will develop properly and grow well; young animals and plants are given rest, and arbitrary interference with their growth is avoided, because it is known that the opposite practice would disturb their pure unfolding and sound development; but the young human being is looked upon as a piece of wax, a lump of clay, which man can mold into what he pleases. O man, who roamest through garden and field, through meadow and grove, why dost thou close thy mind to the silent teaching of nature? Behold even the weed which, grown up amid hindrances and constraint, scarcely yields an indication of inner law; behold in it nature, in field or garden, and see how perfectly it conforms to law—what a pure inner life it shows, harmonious in all parts and features, a beautiful sun, a radiant star, it has burst from the earth! Thus, O parents, could your children, on whom you force in tender years, forms and aims against their nature, and who, therefore, walk with you in morbid and unnatural deformity—thus could your children, too, unfold in beauty and develop in all-sided harmony!

* * * *

"Nature, it is true, rarely shows us that unmarred original state, especially in man, but it is for this reason only the more necessary to assume its existence in every human being, until the opposite has been clearly shown, otherwise that unmarred original state, where it might exist contrary to our expectations, might be easily impaired. * * * *

"This is seen in the child man as a whole; thus the unity of humanity and of man appears in childhood; thus the whole future activity of man has its germs in the child. And it cannot be otherwise. If we would develop man and in him humanity as a whole, we must view him even in the child as a unit and in all his earthly relations. Now, since unity in the finite manifestations implies diversity, and since all all-sidedness in the finite manifestations implies a succession in time, the world and life are unfolded for the child and in the child in diversity and succession. Similarly powers and tendencies, the activities of the senses and limbs, should be developed in the order in which they appear in the child."

These statements seem to mean that the mind has in it from the start the germs of all that it will be, that if left alone it will blossom forth into all its powers and qualities. By a peculiar inconsistency the theory states also that such is the evolution of the *valuable parts* of our mental constitutions, but that our errors and follies and ignorance and vices are due to outside influences. Such a theory is not hard to judge. We know that the uninterfered-with growth of children leads to results far from godliness and wisdom; that grabbing at everything he wishes and keeping everything he grabs and raging at whoever takes it from him, are characteristic of the innate moral tendencies of the infant; that being afraid of the dark and not being afraid of prussic acid or sharp knives or concentrated lye, are among his untutored intellectual manifestations. We know further that a mind left alone will *not* blossom forth into all its powers and qualities from simple facts, *e. g.*, those about children in institutions who are to a large extent so left.

We shall be able to differentiate this theory from one to follow if we now notice its answer to the second question, "What laws does that growth follow?" Fröebel's answer was to give analogies. It grows, he would say, as the seed to the plant, by inner development, or again as the infant

body to the adult, by exercise. It is clear that both of these analogies cannot be true, for the plant does not grow by muscular exercise. In fact both are false, for animals and plants both grow by a splitting of single cells into pairs, due to chemical processes, whereas in the mind there are neither cells nor chemicals nor any signs of any sort of splitting. But neither Frœbel nor any of those who make statements like those quoted, ever really bothered with the attempt to find a serious reasoned answer to our question. They look on the method of growth in a vague mystical way, without seeking a definite detailed account of how it occurs. In this their views differ markedly from another view, which also lays great stress on inner growth as a factor in mental development, but which adds a definite account of how this factor works. This view we may now examine.

Of recent years a number of thinkers about education have been impressed by the facts that the human race has developed from lower forms and that, in the physical growth of each human individual from conception to birth and even later, his body passes through successive stages which are in many respects comparable to the adult forms of different groups of animals, and have wondered whether the same was true of the mind as of the body. The heart of the child is at one period something like the heart of a fish; is there a period when the mind of the infant is like the mind of the fish? etc., etc. Some of these thinkers have thought that the growth of the individual human mind does thus repeat, or to use their customary word, recapitulate the various mental conditions of the animal kingdom in the order of evolution. They would thus have more or less of the growth of the mind come from inner impulse and would say that the inner impulse worked in such a way as to develop a child's mental functions approximately in the order in which they have developed in the animal race. In the child

the mind of a fish will be replaced by the mind of an amphibian or reptile, that by the mind of the lower mammals, that by the mental traits of the primates, that by the mind of the savage, and so on. Just how much of mental development this factor accounts for, just how old a child is by the time it ceases to work, just how exactly the individual repeats the mental conditions which characterized his far-away mammalian or reptilian or annulate ancestors, have not been definitely stated. A vague idea of the extent to which the theory is supposed to reach may be gained from the following quotations from G. H. Schneider, G. Stanley Hall, and from one of the latter's followers.

"The course of mental development is exactly determined through the relation of ontogenesis (individual development) to phylogenesis (the development of the race). The development of the higher (purposive and rational) activities is regulated in every respect in accord with the previously developed instincts, and is primarily conditioned by them. No influence that works in opposition to this development and to the law of inheritance of racial traits in order can ever reach a suitable adaptation, but only disturbs the natural course of development, and creates abnormal misdirected endeavor."—G. H. Schneider, "*Der Menschliche Wille*," p. 489.

President Hall says, concerning the fear children often have of falling:

"Our animal ancestors were not birds, and we cannot inherit sensations of flying; but they floated and swam far longer than they have had legs, had a radically different mode of breathing, and why may there not be vestigial traces of this in the soul, as there are gill-slits under the skin of our necks: and why may not the former come to as great prominence in exceptional stages and persons as the latter do in some monstrous births? To deny it is to make the soul more limited in its backward range than is the body. For one, I am too realistic and cannot think so meanly of the soul as to do this. Although it cannot be demonstrated like rudimentary organs, I feel strongly that we have before us here some of the oldest elements of psychic life, some faint reminiscent atavistic echo from the primeval sea."

Mr. Guillet says:

"As in the physical world, so in the psychical there is a natural order of growth.

Since it is the order of nature that the new organism should pass through certain developmental stages, it behooves us to study nature's plan and seek rather to aid than to thwart it. For nature must be right; there is no higher criterion. There is, therefore, no study of more vital importance to the educationist than this of the natural development of organisms. The parallelism of phylogeny and ontogeny enforces the argument in favor of natural development and the doctrine of katharsis or vaccination as applied to the moral growth of the child. It furnishes a double support to the view that education should be a process of orderly and gradual unfolding, without precocity and without interference, from lower to ever higher stages; that forcing is unnatural and that the mental pabulum should be suited to the stage of development reached. So long as we keep the end in view and do not cause the child to linger in any of the stages, we need not fear the discipline that each stage is calculated to give as a preparation for the next. For what Von Baer long ago said of animals is true also of the child: 'The type of each animal appears to fix itself at the very beginning in the embryo and to dominate the whole development.'

"The period of animal recapitulation is short. In this work the attempt has not been made to deal with the recapitulation of human stages of development, but reasoning from the fact that the length of time taken to recapitulate a period does not depend upon the duration of that period phylogenetically, but upon its recency, we may conclude that the recapitulation of human stages of development is much longer than that of the longest animal stage, viz., the ape stage."

Cephas Guillet, "*Recapitulation and Education*," Ped. Sem., Vol. vii, pp. 427-428.

About such statements and the general theory they represent we may note this much: The mental lives of the different lower animals and of primitive and prehistoric man are subjects for investigation rather than positive statement. We know little about them. So far as the mental development of the child is accurately known, we find few points of comparison after the first year or two. It is not well enough known to justify any final statements. The theory can be appreciated at its full worth or worthlessness only after we know the process of mental development in the individual and in the race. The latter seems to repeat the former only in its most general features. The attempts at concrete parallelism break down again and again. For instance, boys like to go swimming about the same time that they like to climb and to make caves, the two last-named

coming first if any thing. But in the development of the race the fishes preceded the monkeys by whole geological epochs. Again, the impulse to clasp what is touched by the palm of the hand or sole of the foot comes in the first month or two, while creeping comes months later. But walking on all fours appeared in the race ages before the act of clasping with the fingers or toes. Again, what could be a stronger characteristic of the mammals than their tremendous interest in smells and keenness in discriminating them? This should therefore appear in childhood and wane. But it does not to any appreciable extent. We can undoubtedly prophesy certain things about human mental development from knowledge of animal mentality when we get it; but they will be few, will contain little of the answer to our question, "How in general does the mind grow?"

Evidently what we are, what our minds develop into, is not entirely predetermined. Our interests and knowledge and habits and powers are at least partly due to outside influences, to the circumstances into which we are thrown, the environment which acts on us. Some people have seemed to say they were entirely so. Long ago it used to be argued that the mind was a *tabula rasa*, a blank to be filled by life's experiences, a plastic substance to be shaped by circumstances, a river whose course was wholly made for it by the nature of the land through which it ran. Of course these people did not realize the folly of what they said. They did not seem to stop to think of the obvious fact that a puppy brought up in the identical way that his baby playmate was, would nevertheless turn out a different being mentally, that men were not born free and equal, that the same training would result differently in different individuals. Their view finds its practical counterpart in our customs of regarding people as all alike, of expecting children to all learn the same things, of crediting all sane men

with equal legal responsibility. Such a view is simply absurd.

The way a person's mind grows depends partly on inner forces due to the sort of organization he is born with, to his inherited equipment. We get some feelings and ideas, some capacities and powers, some motives and desires, some interests and habits, without effort on our own part or any one else's, without any special influence of any outside thing upon us. The children born yesterday would not grow up to have the minds of sheep even if they were treated like sheep. The human being has as a birth-right certain instincts that make up part of his mental development, certain sense-powers that aid further, the capacity to form ideas, memories, feelings of relationship, to associate similar things, to attend to all sorts of things. Curiosity, or the instinctive general physical and mental activity, is his great teacher until he is a year or more. It is then assisted by imitation, the two together securing for him the great means of mental development—language. The way he shall work over what he sees and hears into ideas and habits of his own, what reaction he shall make to life as he comes to know it, is due in the first place to the capacities for thinking and action that he possesses as a part of his inborn make-up and only secondarily to what he has already learned. He does *not*, however, have apart from experience any *ideas of things*, any *percepts* or *images*, to use the technical words. These he has to acquire. But the organization he is born with does in part decide whether he can acquire them, how fast and for how long.

The mind's growth is thus partly predetermined; it partly makes itself. Each person possesses apart from all influence certain inner tendencies that it is out of the power of education to create or destroy. Examples of such in the case of

instincts we have seen; general retentiveness, eminent intellectual gifts, musical genius, are cases of the sort we have called capacities; the tendency to have ideas and to learn by them is the one tendency that chiefly differentiates the human mind from that of the lower animals. On these tendencies education builds.

The inner impulses to mental development differ with individuals. Men are not born free and equal. If the children in your class had been brought up under exactly the same circumstances, had heard exactly the same words, received exactly the same rewards and punishments, seen exactly the same things, they would still be different. Inner differences would send them into different paths and to different distances along the same path. There is no one mental growth that is the true one.

What should be our practical attitude toward these inner tendencies? Because children do tend to develop in certain ways, should we aim to assist nature, to second by our educational endeavor the impulses with which she has provided the child? No! Only when they further the aims of education, only when they work towards moral ideals. What development *is* can never teach us what it *ought to be*. No word perhaps is a poorer synonym for "the good" than "the natural." We have to fight against, as often as for, the growth of the mind due to its inner predisposition.

The attitude to take toward it is not to curse it as sinful after the fashion of our Puritan fathers, or to worship it as a guide to education after the fashion of some present-day enthusiasts, but to use it as a handy means to our moral ends when possible and to subvert and modify it whenever it blocks their way. We use the river for transport and power when we can; when it bothers us, we dam it up or divert its course.

But, say a certain school, this last is a very dangerous

business. Many things in the natural growth of the mind may be useless or even harmful in themselves, but may be the necessary foundation for something of the utmost value which, had they been weakened, could not have developed.

Such is the tenor of the following emphatic protest by Frœbel:

"How different could this be in every respect, if parents were to view and treat the child with reference to all stages of development and age, without breaks and omissions; if, particularly, they were to consider the fact that the vigorous and complete development and cultivation of each successive stage depends on the vigorous, complete, and characteristic development of each and all preceding stages of life! Parents are especially prone to overlook and disregard this. When the human being has reached the age of boyhood, they look upon him as a boy; when he has reached the age of youth or manhood, they take him to be a youth or a man. Yet the boy has not become a boy, nor has the youth become a youth, by reaching a certain age, but only by having lived through childhood and further on, through boyhood, true to the requirements of his mind, his feelings, and his body; similarly, adult man has not become an adult man by reaching a certain age, but only by faithfully satisfying the requirements of his childhood, boyhood, and youth. Parents and fathers, in other respects quite sensible and efficient, expect not only that the child should begin to show himself a boy or a youth, but, more particularly, that the boy, at least, should show himself a man, that in all his conduct he should be a man, thus jumping the stages of boyhood and youth. To see and respect in the child and boy the germ and promise of the coming youth and man is very different from considering and treating him as if he were already a man; very different from asking the child or boy to show himself a youth or man; to feel, to think, and to conduct himself as a youth or a man. Parents who ask this overlook and forget that they themselves became mature and efficient only in so far as they lived through the various stages in natural succession and in certain relationships which they would have their child to forego.

"This disregard of the value of earlier, and particularly of the earliest, stages of development with reference to later ones, prepares for the future teacher and educator of the boy difficulties which it will be scarcely possible to overcome. In the first place, the boy so conditioned has also a notion that it is possible for him to do wholly without the instruction and training of the preceding stage of development; in the second place, he is much injured and weakened by having placed before himself, at an early period, an extraneous aim for imitation and exertion, such as preparation for a certain calling or sphere of activity. The child, the boy, man, indeed, should know no other endeavor but to be at every stage of development wholly what this stage calls for. Then will each successive stage spring like a new shoot from a healthy bud; and at each successive stage, he will with the same endeavor again accomplish the requirements of this stage; for

only the adequate development of man at each preceding stage can effect and bring about adequate development at each succeeding later stage."

Now it is surely true that the value of any feature of mental development consists not only in what it is *per se*, but also in what it leads to, and that nothing short of an outlook upon the whole of a human being's life can reveal the value of any part of it. But this school of thinkers are apt to hastily conclude that as a general rule the natural growth of the mind is conducive to the best growth. There seems to be very slight evidence of this to compare with the body of evidence showing that human interference with natural growth is the means of advance. We must decide each particular case by itself. Finally, the partial dependence of mental development on inner growth should teach us that education has in the case of every person its limitations. Thus far thou canst go and no farther, is the edict of nature for every child. The physical strength he may possess, the intellectual progress he may make, the work he may do for the world, are all limited by his inborn equipment. If we represent a person's adult status by the distance along a line, we may say that his inborn equipment will be practically sure to carry him beyond a certain point x , and to prevent him from going beyond a certain point y . Education, environment, nurture, will decide what his position shall be between x and y .

We may now turn to the other factor in mental development, the influence of the child's experience. This works (1) by exciting to or restraining from action the child's instincts; (2) by giving or withholding material for his capacities to work with; (3) by forming particular habits and connections between ideas; (4) by directing his mental powers into certain particular channels. The same instinct, combativeness, would develop differently in a boy brought up on the Bowery and in a boy brought up in a community solely

composed of Quaker ladies. The same capacity on a desert island might degenerate through disuse which in New York City would make a man a great orator. The same capacity for intellectual activity might make an Englishman in the fourth century a good hunter, in the twelfth century a logician, and in the twentieth a man of science. The majority of the differences between the concrete habits and ideas of our forefathers and our own are the products of the different surroundings.

The difficulties of theoretical views are due to their efforts to get a simple answer to the question, "How does the mind develop?" No single answer can be true, because the mind is a name for a very complicated set of abilities or functions, and because the development of these is due to numerous and often conflicting causes. And because of the difficulty of estimating the workings of each of these causes, the right answer to the question is hard to obtain, cannot yet be obtained. We can, however, make steps toward getting it, can get parts of it.

If we ask concerning any feature of mental life, *e. g.*, ability in arithmetic, temperance in the matter of food, truthfulness, or what not, "How does this thing develop, come to be?" we may by ingenious investigations aided by caution and patience get a true answer. We may, that is, find out in what respects the feature in question depends upon inborn aptitudes and in what respects upon outside influences, and what are the latter's nature and method of action. Any one such investigation would involve a tremendous amount of both talent and effort.

In consideration of the complexity of the problem, it is more profitable for a teacher to follow carefully a few sample studies bearing upon it rather than to learn any general answer to it, and no general answer will be given here. One of the best of such studies is Francis Galton's "The History of Twins," reprinted in *Teachers College Record*, May, 1901.

18. ADOLESCENCE

WE may use the word adolescence to refer roughly to the years that intervene between childhood and adult conditions, to the period beginning just before puberty and lasting to say twenty-five years. What I shall say about adolescence will be especially applicable to the first five or six years of this period.

There is, beginning at 11 or 12 in girls, 13 or 14 in boys, a period of abrupt transition both bodily and mental. Children, we have found, are always changing, but at this time they change much more rapidly than usual. The physical changes, special and general, are in the line of greater strength and health, of greater sex differences. A convenient account of them may be found in the chapter on Adolescence in Rowe's "Physical Nature of the Child." The mental changes are not quite so obvious and not nearly so easy to measure or describe. They are, however, of enough practical importance to be studied in detail. The psychological foundation of secondary education is, apart from general principles of human nature, the peculiar characteristics of the mind at adolescence.

These characteristics may be best summarized under two heads, (a) the specific and (b) the general changes due to adolescence.

(a) Just as specific bodily functions appear in this period, so also there arise definite instincts and impulses connected normally with the opposite sex. They give rise to the same practical problems that any instinct does, the main difference being the tremendous vitality and strength of the sex instincts. Like any instincts they may be strengthened,

inhibited, directed or perverted.¹ They often disturb the regularity and efficiency of school work by their natural absorption of the attention. Falling in love in some one of its various forms has been a common reason for neglect of work in the case of boys and girls old and young.

(b) Besides these well known specific mental changes there are less noticeable general changes. Of these the most important are an increase in general mental vigor and a heightened and unstable emotional condition. The former parallels the increase in physical strength and the latter is the motive power supplied by nature to keep adult functions active. The practical problem is briefly to meet the demands of the mental and emotional vigor and provide them outlet in proper channels. The emotional instability, the alternation of happiness and misery, satisfaction and remorse or self-depreciation, is of no value, and the many boys and girls who do not manifest it are to be congratulated. Those who do should be taught that these feelings of theirs are of no consequence, that they in no wise reveal anything concerning their real welfare, but are merely accidental accompaniments of certain physiological conditions.

If this could be done a good deal of the agony of the so-called "storm and stress," would be avoided. For one of the chief reasons why young people are likely to worry about themselves and their futures, the truth, the really right, their real merit or blame and other soul-stirring matters, is that they mistake feelings of depression for evidence of real guilt, feelings of malaise and bodily dissatisfaction for real doubt and perplexity, etc., etc. The ebb and flow of feelings due to the emotional instability of adolescence, they take to be important symptoms of their souls' real con-

¹ Emotional attachments between school girls or between school girls and their teachers are frequently significant of highly morbid and abnormal conditions. Teachers should discourage them.

dition. Some young men and women suffer intolerable pain from this cause. So common are such cases that several authors have taken this "storm and stress" to be an essential feature of growth.

Prof. Burnham writes as follows in the *Pedagogical Seminary* (Vol. I, pp. 182-183):

"A few years ago, under the direction of President G. Stanley Hall, the writer endeavored to collect some data in regard to the function of doubt in adolescent development. A circular letter was sent to a few students, most of whom were specially interested in philosophy, requesting them to report the function of doubt in their own development, and to describe any storm and stress period that might have occurred in their experience, giving details in regard to age, environment, and the like. Letters giving personal experiences were received from twenty persons. Although the number of my correspondents was small, different nationalities and different forms of education were represented; and the writers replied with so much frankness and detail that their letters furnish valuable material for illustrating one at least of the many forms of adolescent activity, *i. e.*, philosophic and religious thinking in its different phases. At the time of replying to my letter most of my correspondents were just past the period of adolescence or near its close. Three-fourths of them had passed through a more or less disturbing period of doubt."

Prof. Burnham quotes John Stuart Mill's autobiography as representative of a typical case:

"It was in the autumn of 1826. I was in a dull state of nerves, such as everybody is occasionally liable to; unsusceptible to enjoyment or pleasurable excitement; one of those moods when what is pleasure at other times becomes insipid or indifferent; the state, I should think, in which converts to Methodism usually are, when smitten by their first 'conviction of sin.' In this frame of mind it occurred to me to put the question directly to myself: 'Suppose that all your objects in life were realized; that all the changes in institutions and opinions which you are looking forward to, could be completely effected at this very instant; would this be a great joy and happiness to you?' And an irrepressible self-consciousness distinctly answered 'No!' At this my heart sank within me; the whole foundation on which my life was constructed fell down. All my happiness was to have been found in the continual pursuit of this end. The end had ceased to charm, and how could there ever again be an interest in the means? I seemed to have nothing left to live for."

If there had been any hereditary tendency to insanity, Mr. Mill's state of mind would probably have developed into melancholia. "The lines in Coleridge's *Dejection*," he says, "exactly describe my case:"

"A grief without a pang, void, dark, and drear,
 A drowsy, stifled, unimpassioned grief,
 Which finds no natural outlet or relief
 In word, or sigh, or tear."
 * * * *

"To know," he says, "that a feeling would make me happy, if I had it, did not give me the feeling." Precocious and premature analysis became the inveterate habit of his mind. He adds: "I was thus, as I said to myself, left stranded at the commencement of my voyage, with a well-equipped ship and a rudder, but no sail; without any real desire for the ends which I had been so carefully fitted out to work for; no delight in virtue, or the general good, but also just as little in anything else. The fountains of vanity and ambition seemed to have dried up within me, as completely as those of benevolence. I had had (as I reflected) some gratification of vanity at too early an age; I had obtained some distinction, and felt myself of some importance before the desire of distinction and of importance had grown into a passion; and little as it was which I had attained, yet having been attained too early, like all pleasures enjoyed too soon, it had made me blasé and indifferent to the pursuit. Thus neither selfish nor unselfish pleasures were pleasures to me. . . . These were the thoughts which mingled with the dry, heavy dejection of the melancholy winter of 1826-7. During this time I was not incapable of my usual occupations. I went on with them mechanically, by the mere force of habit. . . . In all probability my case was by no means so peculiar as I fancied it, and I doubt not that many others have passed through a similar state; but the idiosyncrasies of my education had given to the general phenomenon a special character, which made it seem the natural effect of causes that it was hardly possible for time to remove. I frequently asked myself, if I could, or if I was bound to go on living, when life must be passed in this manner. I generally answered to myself that I did not think I could possibly bear it beyond a year."

The "storm and stress" phenomena are probably not the necessary result of the new life of adolescence, but rather of the combination of the habits of introspection and moral strenuousness with emotional instability. A child trained in the self-examination cultivated by the evangelical religions is likely to take the rise and fall of emotions, the prevalence of different moods as symptoms of his soul's welfare, and so to have a "storm and stress" period. But young Indians, Turks, Chinamen or Mexicans rarely manifest the phenomenon.¹ The educated boy, especially the

¹ For this fact I am indebted to an unpublished study by Miss E. K. Carmen.

one who has some notions about things in general, some sort of a world view, is likely to refer his moods to the constitution of the universe, and so to evolve doubt and even despair, while the untutored, objective youth, takes them as mere matters of fact.

19. CHILDREN OF THE KINDERGARTEN AGE

SOME of the matters already studied are particularly relevant to the education of children from 3 to 6 years of age.

What has been said concerning instincts or native tendencies to act, concerning learning by trial and accidental success and by imitation, children's confusion of their mental imagery with facts, the real nature of the symbolism of young children, the mechanics of reasoning and the motor inability of children, is applicable with increased force to children of the kindergarten age. Indeed we must get out of the habit of thinking that there can be any absolute division of development into stages, and must realize that children four years old become children eight years old by a continuous change. All the statements we have made apply when properly modified to very young children. As a boy grows up he does not jump from one water-tight compartment to another, but changes gradually.

We, therefore, do not need to have a new child psychology here. Apply the principles already noted, bearing in mind (1) the lack of time for certain instincts to wax or wane as the case may be; (2) the lack of experience of things, thoughts, feelings and acts, and you have the means of gaining insight into the physical and mental behavior of children from three to six.

I shall, therefore, note here only some matters which have been studied more in the case of very young children than elsewhere. These matters might, however, have been brought up among our previous topics, for they concern all children, though perhaps to a less degree. They are: (1) "Curiosity as a Factor in Development;" (2) "Play;" and (3) "Animal and Savage Traits in Children."

I use the common word curiosity to refer to the instinctive tendency of children to enjoy action and thought for their own sake, regardless of any ulterior consequences. Children like to take and hold and drop and throw things, to run and talk and gesticulate, to see and hear and feel and smell, to have ideas and fancies. The following is the record of what one four-year-old did in the course of fifty minutes:

"As I came into the room Harold ran up to me with his thumbs in his ears and wagging both hands. I said, 'Whose ears are those?' 'Your ears,' he answered. He pointed to the curtain, 'That's where I hide and frighten papa, and over there too,' pointing to a closet. 'What are you making there?' as I began to write. Then he began to dance about the room, and presently brought me a bank. 'What is this for?' I asked. He said, 'Down they go. If you have a penny I put it in—down it go!' I sent him for my purse, telling him it was in my bag. In a minute he came back with the bag. 'This is funny pocke-boo you call.' I gave him a penny and he put it in. 'Down it go,' he repeated. 'How many pennies have you?' I asked. 'Bight pennies,' he answered. 'I dot a fire engine, if your house on fire, I come. I do this. Sis! Sis! Hose make all go out.' 'Fire out there in next room. I playing in yard and mamma call me—Miss B—— say mamma call me, and I say, 'What for?' and mamma say, 'Dere is a fire, and me say I want to see. Only liddle minute for dose engines to come.' I was busy writing, and so said, 'Was it?' He immediately mimicked me saying, 'Wase, wase.'

"Speaking to his mother, 'Give me a cacker.' Picked up a dress suit case and carried it about the room. 'Going to be a party here to-night,' he said. He evidently connected party and dress suit case in his mind.

"Then he began going around the room like a frog—ran up to his baby sister and hugged and kissed her. Began singing 'Happy Day' at the top of his voice.

"His mother took out a book to show me and he came up. 'Picser dere was,' and I let him find the pictures. 'Carving man's face dose two fellows. Here's duns, here cap, here house'—then seeing that it was not a house really (it was the outline of a picture on the next page), 'Whas makes dat anyway!' Turning the page—'Carriages, horses, two mens.' Suddenly he left me and went to watch his mother wrap up a package. She was sitting in his rocking chair so in a minute he said, 'I'm going to sing—get up mamma.' Sat down in his chair and began singing 'Happy Day.' He sang a line or two, then asked, 'What nex?' His mother told him, and so he went on, but the chorus he remembered and sang with a will. I asked him where he learned it. 'Danpa said it at chool,' he replied. Mrs. L.—told him to say his verse to me. 'The day of the Lord is at hand, dats a nice varse.' At the word 'hand' he threw out his own hand, though he had not been taught to do so.

"'Whas you makin dat for,' he asked again, so I told him to write his name for me. He printed H then said, 'See—Whas nex?' 'Is the tent nex?' I told him, 'Yes,' which he made A. I asked him what he had made and he replied, 'Me.' 'Dis where I do paint picsters,' meaning on his little table. Pointing to the letters, 'Too bight.' He had put his pencil in his mouth and the marks were black. 'Whas come asser de tent?' R, I told him. 'What R? Wound? Ike dat?'—making an O. Mother shows him. 'I dought so. Wait dat ain't all over (rubbing out)—dot wrong end (of pencil). Das too bight—I put in my mouf.' He left the table and went over to hug the baby again—she caught the pencil—he, dancing up and down, 'O de monkey on de stick.' He left her and went back and finished his name, just Harold. 'What have you written?' I asked. 'Harold L——,' he answered. I showed him how to make the A correctly. 'Now I wite over again like you. Now watch what I do.' He drew the two lines between which he was going to write very slanting. 'Lines go down like car go off his track.' His mother began to eat a cracker. 'You get it on your dress, then you have to sweep up cause it goes on floor when you gets up.' He began to rub the paper, 'You know what I doing? Ise getting lines out—I try punch them out. Tent right up side, I don't find so. Yes, yes. I needs a sharper pencil. Papa going bring big knife tut my pencil in pieces. Look, look, see what I made.' He had finished printing his name again. 'Has you dot wubber balls in your stumick? I'se Asbury Park some boy, no Amy, took me dere and he puts his head behin and lots, lots balls come out.' Some one had taken him to see a juggler and he remembered about it. His chair slipped and he fell on the floor, but as his mother laughed he followed her example. When he got up, however, he made faces at and whipped the chair and table. 'Give me a light and I get dose blocks Mamma, and I make a house for you' (speaking to me). He picked up a wooden watch and holding it up to me said, 'Is it time for me to take my medicine, or what?' Then in a whisper, 'Don't tell Mamma. Look at baby creep, las time she roll over and over—now she creep.' The baby picked up a button and put in her mouth. He called out, 'She eatin somefin—may be her gums.' Just then Mr. L—— came in and brought Harold a little gray rabbit. He was delighted. When it was put on the floor and began to hop about he called out, 'Don't creep on me!' The baby sat and looked at it, so Harold began to pat her back, 'Don't be faid, dat won't bite you.' As the rabbit sat up and looked about, Harold said, 'He say, What is dat? He is biting—gin him something to eat,' as it moved its nose. 'See his little toesies. Do you feed him bed? Me bring some from supper.' Tries to feed it a block. Kisses and loves bunny and won't let baby touch it. As the bunny hopped on the marble hearth he said, 'May be his footies feel cold,—he dot no shoes. He needs a strut and a strut Keener.' Mrs. L—— lifted the rabbit by its ears, which amused Harold very much. 'Lift him again, lift him again. What's the matter, darling?'

"And so he was still talking to the rabbit when I left him. One thing I have

not mentioned; he has a great habit of repeating many things that are said. When he has nothing to say himself he will simply repeat whatever is being said.

"This is not complete, for Harold kept up such a constant chatter that I was unable to make a note of a great deal that he said. He had not the least idea what I was doing and was very natural and unconstrained." *

The conversation of a two and a half year old is reported by Professor Harlow Gale, as follows :

"In her first play for the day with her doll, about three-quarters of an hour after waking and before breakfast, 3, G. kept up the following stream : 'My little baby, my little baby. Momsie, momsie, jiggle my little baby, jiggle my little baby. Please put that little pillow in, put that little pillow in—little pillow in. I did put. Just little tiny bit, little tiny bit—little, little, little. Going take nightgown off. Safety pin, safety pin. Put that on bed. Going put that on, going put little pillow way. Please help me put my little baby's sleeves in. I call that my little baby. Why I—I—I? Try pin. Can't pin. Why write that way? Don't want my pillow—want that pillow—want—. Where that little baby sleep on my pillow? (Repeated.) Why do just like that way? That bedspread lie on. (Repeated.) Little baby—cover legs. (Sings): Sweet little baby—Oh little baby, Oh little baby, Oh little baby, Oh little baby. Put that—that bedspread little baby lie on,—have bedspread. Go right off. I going put my hands on that. Try make that stick together—stick together; try make that stick together—go together all nice. My little baby can't lie. What? what? I used my—away back on mamma's bed. Can't tell Hilsie that. My baby got two little shoes, two little stockings on. (Repeated.) Can't take off. My poor baby got go bed, got stay in bed. Got little neck, little neck, cunning little neck—little neck. Please unpin that safety pin, momsie. My little baby not very well—have stay in bed. No, my little baby's nightgown—that grandma made (latter four times)—other mamma made me—that Emma made me, that Emma made me. That mamma crochet, mamma crochet other one—other one. Hasie have that one (repeated twice) that one. My little baby have sleep on—where my little pillow? Got little chin. Why do that way? Got no nightgown. Play with little safety pin.' She then changed off to another doll.

"It is astonishing how this activity keeps up to the end of the day and the child struggles against fatigue and sleepiness. After having looked at his Brownie book in bed awhile, he was laid down by his mother to be sung to sleep as usual and the gas was turned down. Whereat he said : 'S. can't see—S. can't see. P. now give S. some more paper to write on, two more and that will be all. Sammylein, Hildelein, Mammalein, Dicklein, and that will be all. S. can't see.

* For this record I am indebted to Miss Naomi Norsworthy, of Teachers College.

(repeated five times, and seven nos.) Yes, S. want drink. Now, P. drink some—now S. want 'nother drink. Now don't write M. S. isn't getting tired. This water baby. Why? Go way up to that corner. S. don't want to. S. isn't sleepy. S. got jelly glass at S. house. M. don't turn down gas, don't don't, don't. Where P. go? No, no. (Finally weakening he says) S. want go S. bed. S. want green Decke. S. want S. pictures. M. sing some Schub(ert). Was this right way? (adjusting his beloved green Decke) this right—yes. M., S. want those two pieces paper—give S. some paper. S. have to roll up. M. cover S. Where P.? Where P.? M. where P.? M. sing loud. M. lie down on P. bed,' when the little Mannlein suddenly fell off to sleep."

This instinctive tendency in young children to enjoy action and thought for their own sake is important because it is a sign, a means, and a limiting condition. It is a sign of vitality and of the possibility of mental progress in young children, and when in later years (*e. g.*, 10–14) it is uncontrolled, undirected, it is a sign of lack of mental health and of difficulty in mental progress. It is a means to the acquisition of knowledge and skill. With proper guidance it changes from lawless promiscuous activity into definite interests in nature, human affairs, abstract thinking, wit and handicraft. It limits our treatment of children; for, the younger they are, the more we are obliged to give the tendency free play. Healthy children will be active in spite of us, and we must arrange their training so as to give it an opportunity, or the attempt to keep up discipline will absorb all our efforts.

The problem for the teacher of very young children is thus to note this tendency as one sign of a child's general condition, to direct his activities along lines which will not violate hygienic desiderata, nor prevent his present comfort or his future happiness and usefulness.

Our next topic, "Children's Play," is closely allied to the one just discussed, for, as a matter of fact, the activities which we ordinarily mean by the word play are one group

of these general activities of body and mind in which the child engages apart from any impulse to gratify immediate practical wants. The play group is marked off from the rest only indefinitely and indeed often is taken to include the rest.

The play of children differs notably from that of other animals. The latter play in childhood a few plays along narrow lines which closely correspond to and prepare them for the serious business of their adult life. The dog, for instance, plays at following scents, fighting and display. The kitten plays at catching and worrying small moving objects.

The human animal plays in childhood in a similar manner to some extent. He does tend to play fighting, play running and hunting, and play display. But the bulk of his play is not along specific lines and provided for by particular instincts; it is a general activity due to his general instinctive enjoyment of thought and action for their own sake. Thus his play prepares him for the serious business of his adult life only when we direct it into the specific lines which we know he will later have to follow. The play of the dog is fitted by nature to adapt him to his narrow career as a dog. The play of the child is fitted by nature to adapt him to anything or nothing according as we artificially guide it. Play gives the dog the surety of learning a few things. It gives the child the possibility of learning an infinitude of things.

With experience the play of children becomes changed from direct, natural, instinctive activities into elaborated artifices. Children learn which particular combinations of acts or feelings or acts and feelings give them the most pleasure for the effort. They modify and imitate and invent until they get plays from which the disagreeable elements of pain and effort are eliminated. Thus to mere running is added the excitement and variety of running after some one, and to that the excitement and emulation of running to

catch or surpass, and to that the intellectual joy of running craftily or in combination with others. Games are thus the result of the experience of the race in purifying physical and mental activities from their disagreeable elements or accompaniments and combining them so as to heighten and vary their desirable results. One of the problems of education is to select and invent games which shall not only fulfil this desideratum, but shall also advance the higher ends of physical and moral welfare, to make these operative in educational systems, and to make sure that the way they are played does not subvert their purpose. Often the best rule will be to leave children to their own devices in the matter. Often it will not.

There are a number of resemblances as regards mental characteristics between children and savages, or even the lower animals, so many that children are often called "little savages" or "little animals."

During the first year an infant certainly behaves more like a monkey than like a human adult. And during the first five or six years his love of movement and sense-excitement, his lack of the self-control shown by civilized men, his naïve explanations and superstitions, his variable moods, his carelessness of the past and the future, remind one irresistibly of the mind of primitive man.

But the baby is not a mere animal, or the child a mere savage in miniature, for he has the capacity to become a civilized adult as they do not. Traits which in them will be permanent, in him are transitory. Traits which in them are due, at least in part, to differences in organization, are in him due to lack of experience. To some extent their make-up denies savages the promise of passing out of superstition, improvidence and impulsiveness. To just what ex-

tent we do not know. Just how a hundred Indian babies would turn out if they were brought up just like New York children, we cannot tell. There would be some difference.

The agency which, in combination with their inborn capacities, leads children out from their so called savage condition is the accumulated stock of civilized traditions and customs which they learn and into conformity with which they bring their actions. The arts and sciences, the trades and occupations, the customs and ceremonies of civilized life conform the child gradually to an intelligent, industrious and moral life.

The kindergarten is the systematic effort in our educational system which begins this transformation. It must necessarily take account of the status of children at the age it receives them, and particularly of the existence in them of the animal and savage traits we have mentioned.

Practically the only recognition of them in our present kindergarten system is the adoption of folk-lore and myth as material for the games and songs and stories. It is supposed that since primitive people originated the myths and folk-tales, such will be specially fit for children and secure their interest.

The fitness of such material for children, as well as its value in advancing their development, depends almost entirely upon the way it is used. It is doubtful if many of the modern presentations of myths would appeal at all to primitive races, and when children do appreciate them it is perhaps rarely from reasons influential with primitive races. Moreover, the background of the life of the youngsters in our kindergartens prevents the acceptance of myths in anything like the spirit which originated them. Elevators, trolley cars and electric bells, steam heat, mechanical toys and automobiles—these are samples of the conditions that surround him and make even so slightly primitive a thing

as sleeping out-of-doors, or traveling through the woods, a matter of mystery and romance. What was real to primitive people is play to the modern child.

It seems likely, therefore, that the value of myth and folklore to children consists in their intrinsic qualities as food for his imagination, helps to play, rather than in their relation to primitive life and early instincts. They are to be judged by the same criteria as any stories.

A better way to make use of primitive traits in children might be to provide them systematically with a chance to lead a really primitive and out-of-doors life, to work and play with animals and plants, to get their own meals and learn some of the simple ways to overcome nature's obstacles. Wise parents have always appreciated the value to children 4 to 10 of country life with little restraint. In towns and in the smaller cities, systematic provision for it would not be difficult. In the larger cities, where it is most needed, it is a financial impossibility.

20. PRACTICAL WORK

With Sections 2 and 3.

LET all the members of the class measure the height and length of head from front to back of four children in centimeters and millimeters, without observing each other and without comparing results. Then put on the board the results of all the observers for each individual. How well do they agree in each case? What are the reasons for the variation with different observers? How can one make sure that he gets accurately the real height or length of head of a person he measures?

With Sections 2 and 3.

Give to sixty or eighty children in the same grade a spelling test of 25 hard words (such that probably no one will get them all right). Have the students correct these papers. Put a list of the marks thus obtained (in each case the number of words spelled correctly) on the board. Let each student make out a distribution curve showing the average ability of the class tested to spell those words, the variation of the class in general from the average and the limits of variation from it which will include two-thirds of the class.

Let each student present as briefly and clearly as he can the following facts:

Of 123 6th grade children who worked 5 minutes at a number of multiplication examples,

19 made 0 mistakes.

21 made 1 mistake.

21 made 2 mistakes.
12 made 3 mistakes.
15 made 4 mistakes.
8 made 5 mistakes.
14 made 6 mistakes.
4 made 7 mistakes.
3 made 8 mistakes.
2 made 9 mistakes.
3 made 10 mistakes.
0 made 11 mistakes.
1 made 12 mistakes.

With Section 4.

Let the students visit some school-room (five or six at a time), and note the children who seem to them to show signs of developmental defect or of bad nervous action or of malnutrition. Have them note also in each case what the signs were that they observed. The observers should sit at the side of the room near the front. Make similar observations with care yourself. Discuss all the observations in class. If it can be done with propriety, exhibit typical cases to the class. One way to do this is to ask that three or four children among whom the case is included be sent up to the child study class on some errand such as to show some drawing made by the class.

In a second visit students may note which children are mouth-breathers, or hold their eyes nearer their work than 10 inches (and for what proportion of the time), or habitually take bad postures, or show signs of fatigue (and what signs).

With Section 7.

Test 10 or more children in the third or fourth grade for

vision in the presence of the class. Use Snellen's test types. Let the class have copies of the test cards, and record the results of each test. After testing three or four children, let members of the class test the others. After the tests are completed, compare the records made and note any errors.

Show some different methods of testing hearing, *e. g.*, with a watch, with whispered words, with shot of a standard size dropped into water from a constant height. The latter test seems a good one because it avoids the variations due to comprehension of words. The children have simply to tell whether they hear one, two or three sounds. But it is in some ways an inconvenient test to administer.

If desirable, show method of testing for color-blindness.

The teacher should, if he is himself used to handling scientific data, and if his class contains reasonably advanced students, explain the mathematical formulæ by which we can determine the reliability of results, and give the class practice in the calculation of the standard deviation and in the use of the formula $\frac{\mu}{\sqrt{n}}$ and of the table of frequencies of $\frac{1}{2}\mu, \mu, 2\mu$, etc. This may well be done as a voluntary exercise by those who care to.

With Section 8.

Give to some grade the first week in the fall some geography or history test they had the previous spring, the papers from which have been preserved. Let each student in the child study class compare one or more spring papers with one or more of those in the fall. Bring together the results of the comparison in class. How does this simple fact of the inability of a teacher to count on the knowledge gotten in a previous grade influence her conduct of recitations?

